



Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Vehicle Communication Interface

Test Model: GWSMARTBT

Environmental Conditions

Temperature:	23.8°C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Luo
Supervised by:	Nick Peng





B.1 -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant	0.655	≥ 0.5	Pass
NVNT	BLE 1M	2440	Ant	0.653	≥ 0.5	Pass
NVNT	BLE 1M	2480	Ant	0.659	≥ 0.5	Pass
NVNT	BLE 2M	2402	Ant	1.131	≥ 0.5	Pass
NVNT	BLE 2M	2440	Ant	1.143	≥ 0.5	Pass
NVNT	BLE 2M	2480	Ant	1.142	≥ 0.5	Pass



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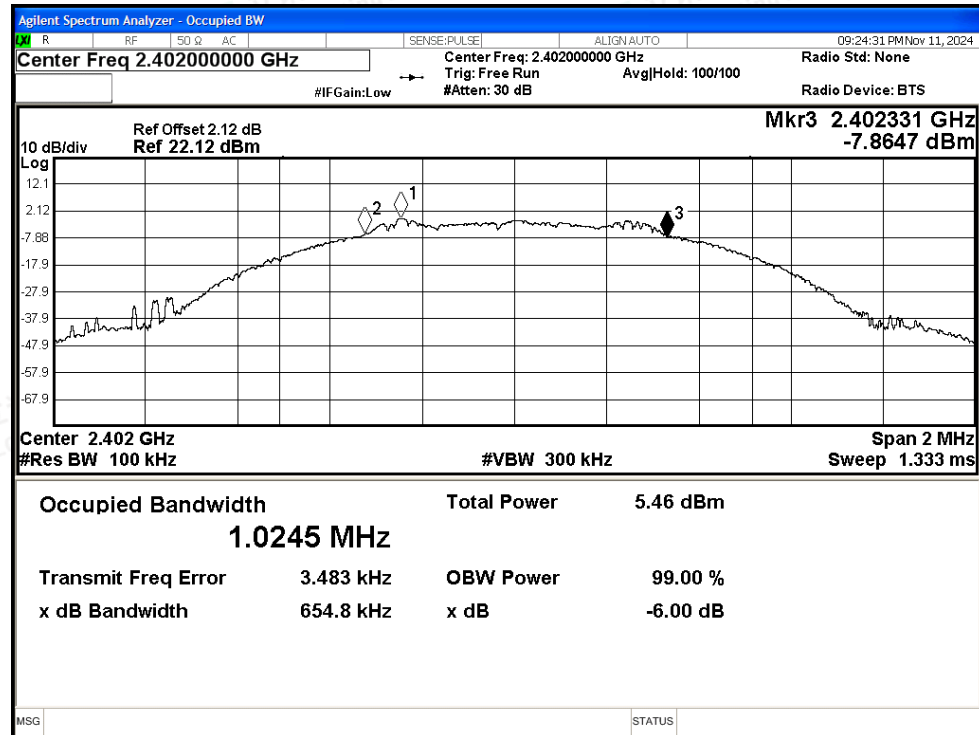
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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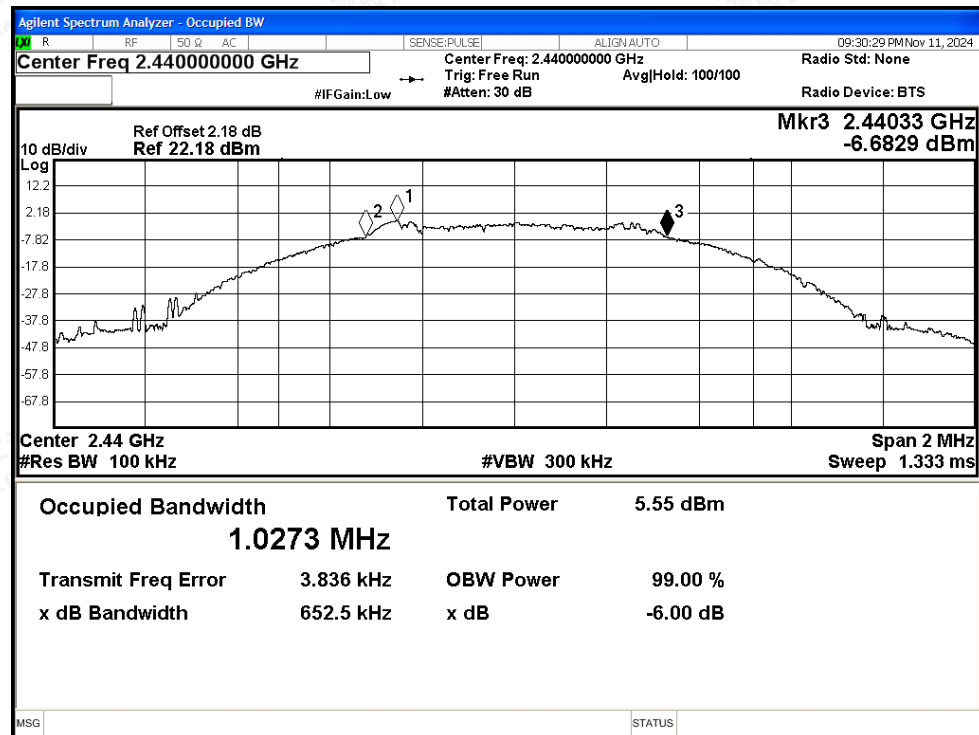


Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant



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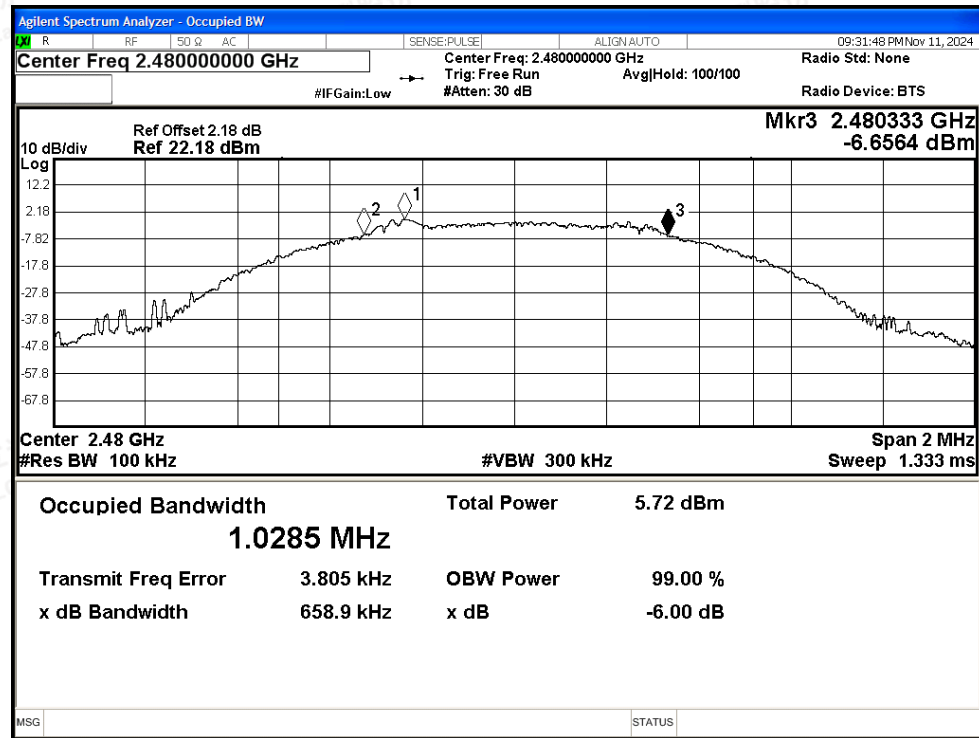
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-6dB Bandwidth NVNT BLE 1M 2480MHz Ant



-6dB Bandwidth NVNT BLE 2M 2402MHz Ant



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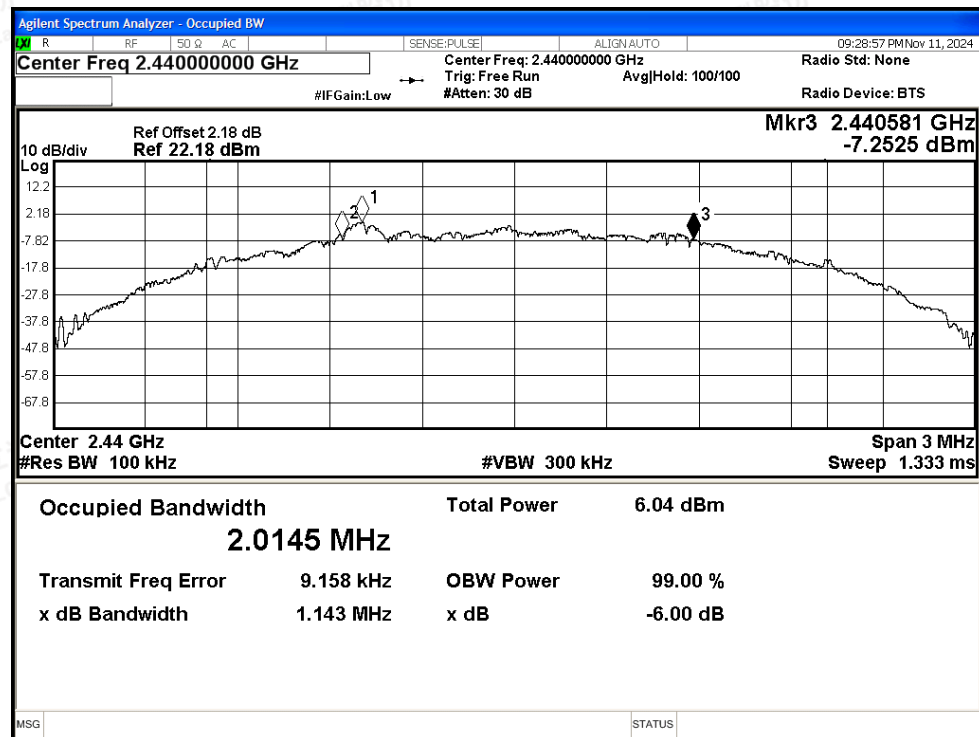
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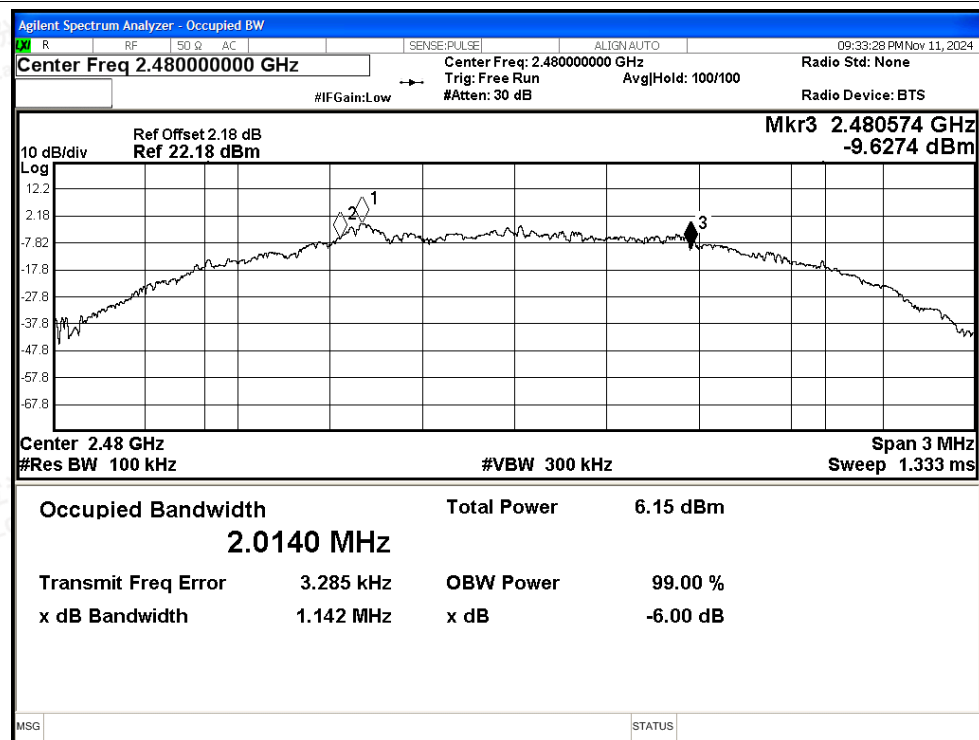
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-6dB Bandwidth NVNT BLE 2M 2440MHz Ant



-6dB Bandwidth NVNT BLE 2M 2480MHz Ant



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B.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant	-0.25	30	Pass
NVNT	BLE 1M	2440	Ant	-0.12	30	Pass
NVNT	BLE 1M	2480	Ant	0.06	30	Pass
NVNT	BLE 2M	2402	Ant	-0.45	30	Pass
NVNT	BLE 2M	2440	Ant	-0.32	30	Pass
NVNT	BLE 2M	2480	Ant	-0.17	30	Pass



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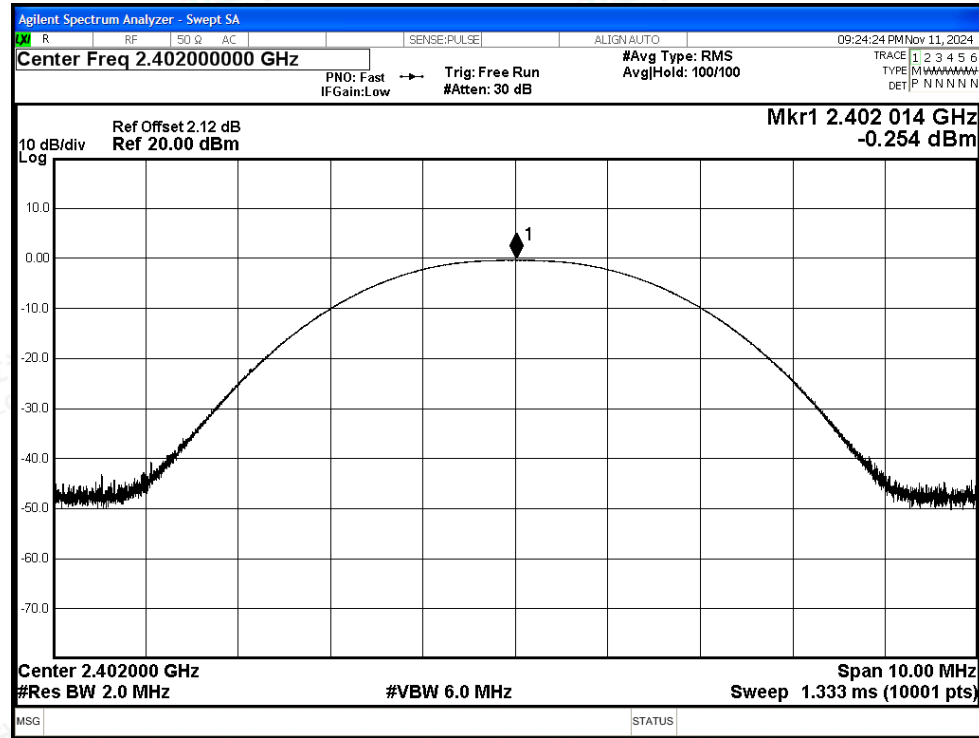
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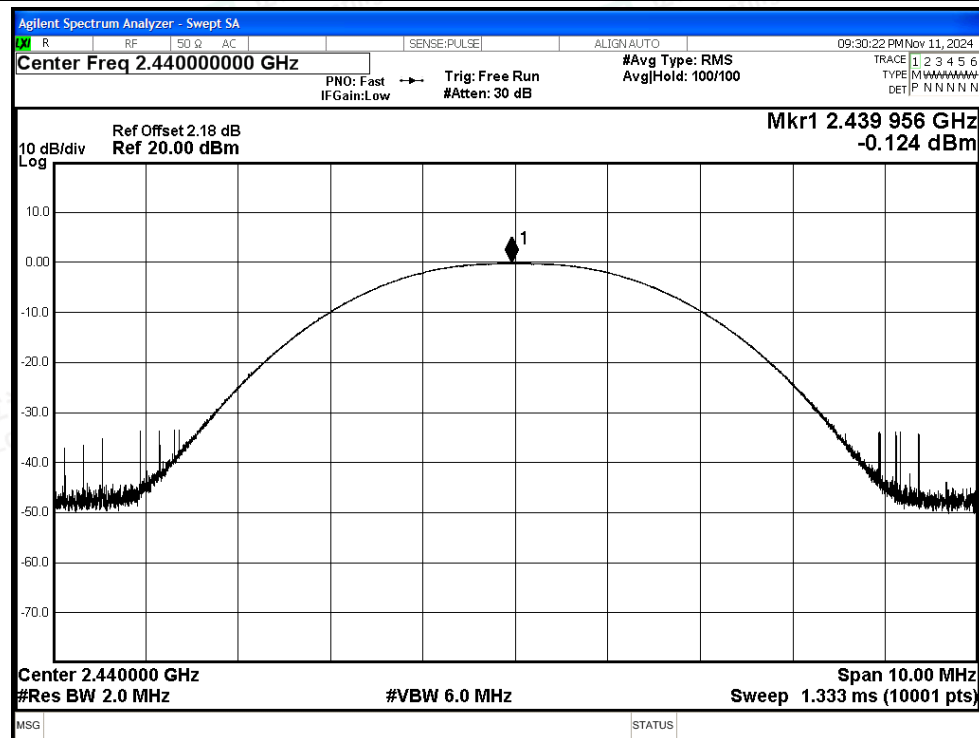


Test Graphs

Power NVNT BLE 1M 2402MHz Ant



Power NVNT BLE 1M 2440MHz Ant

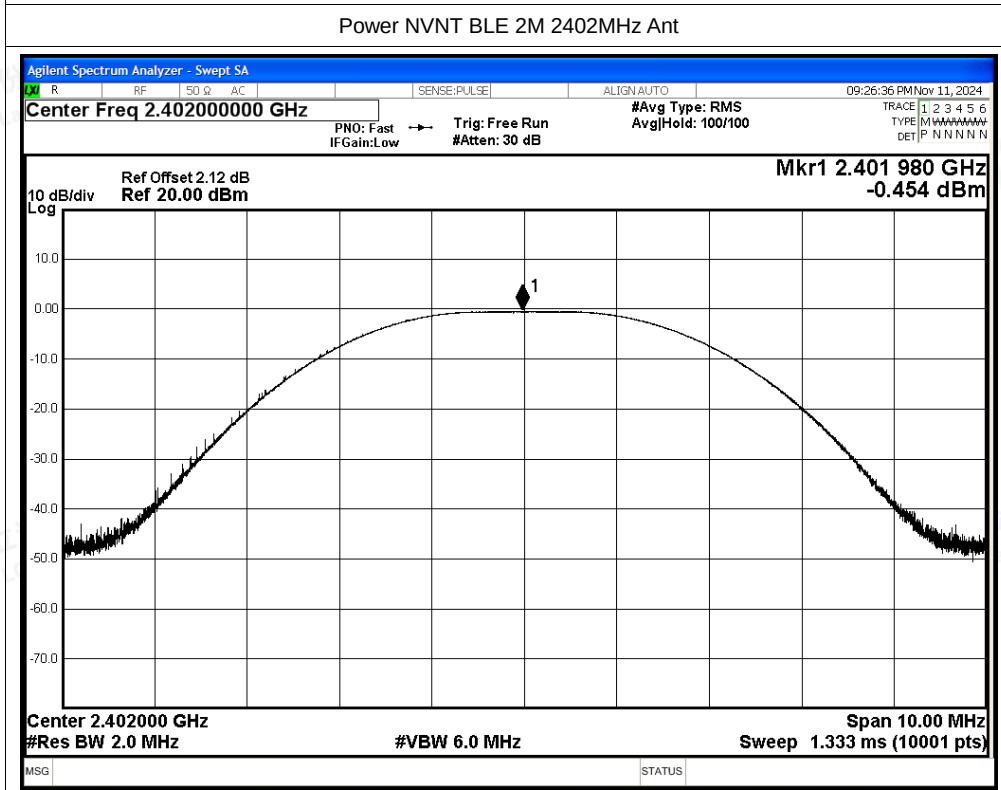
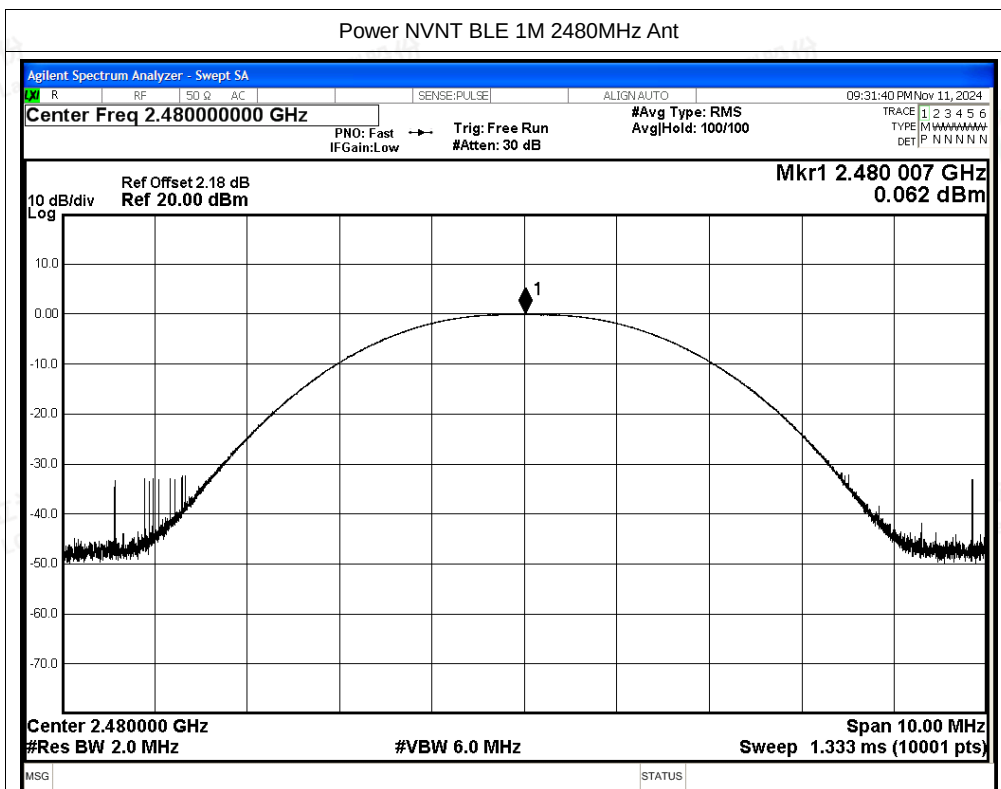


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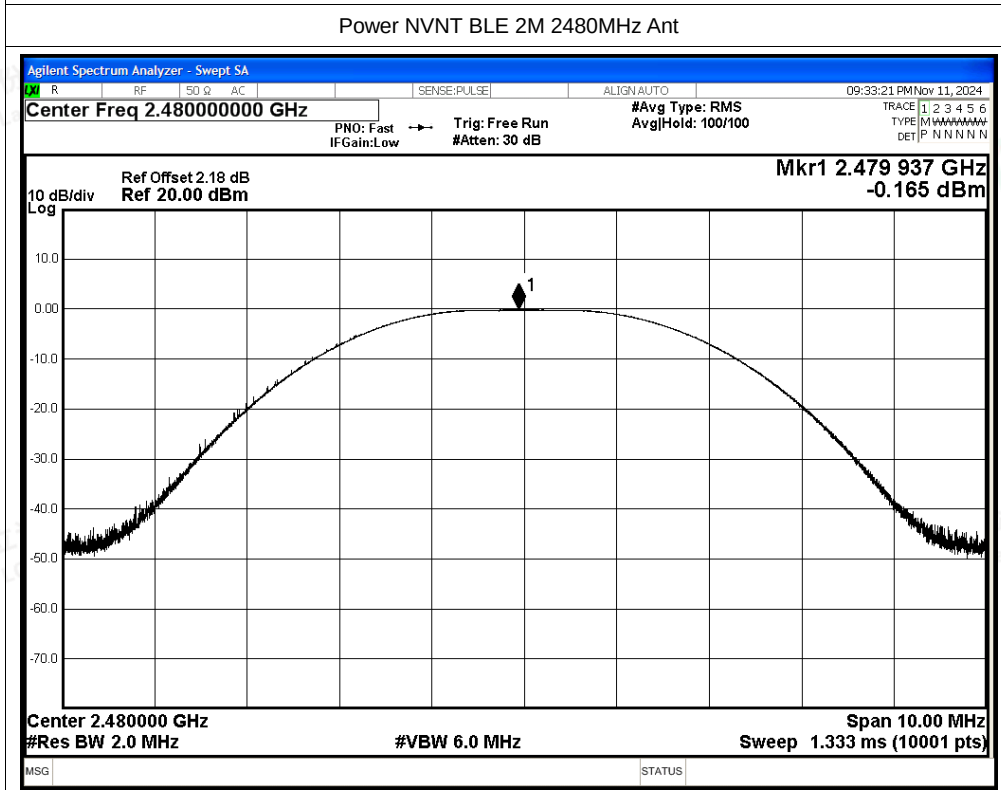
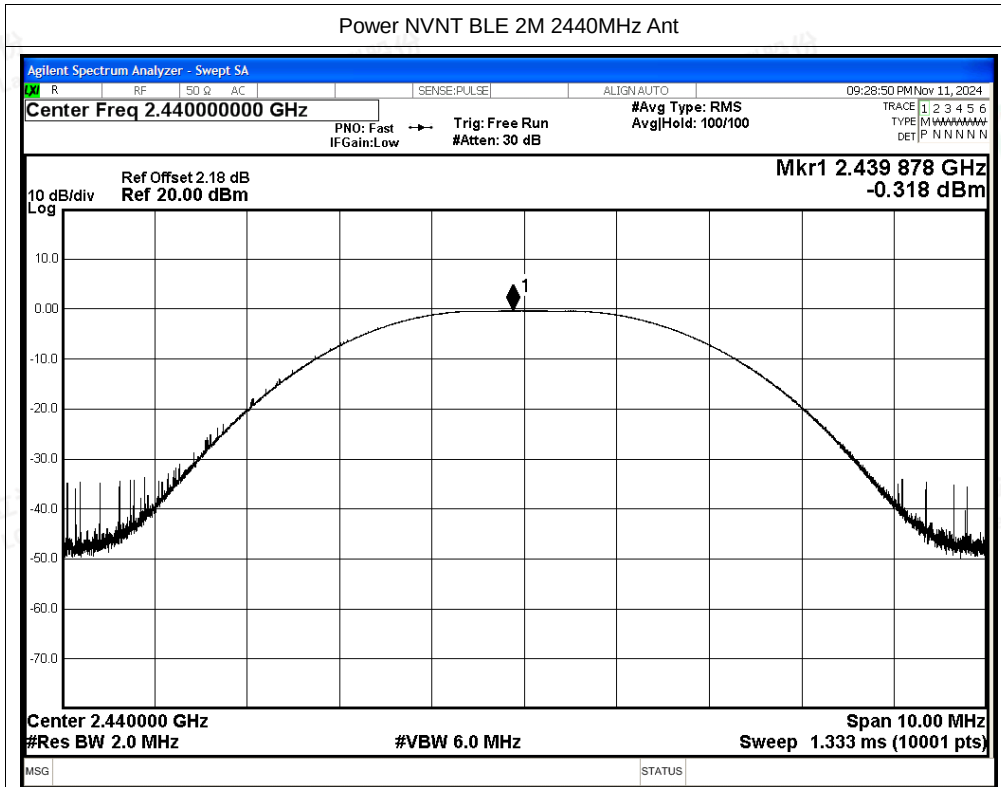


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B.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant	-16.85	8	Pass
NVNT	BLE 1M	2440	Ant	-16.74	8	Pass
NVNT	BLE 1M	2480	Ant	-16.8	8	Pass
NVNT	BLE 2M	2402	Ant	-20.26	8	Pass
NVNT	BLE 2M	2440	Ant	-20.38	8	Pass
NVNT	BLE 2M	2480	Ant	-19.91	8	Pass



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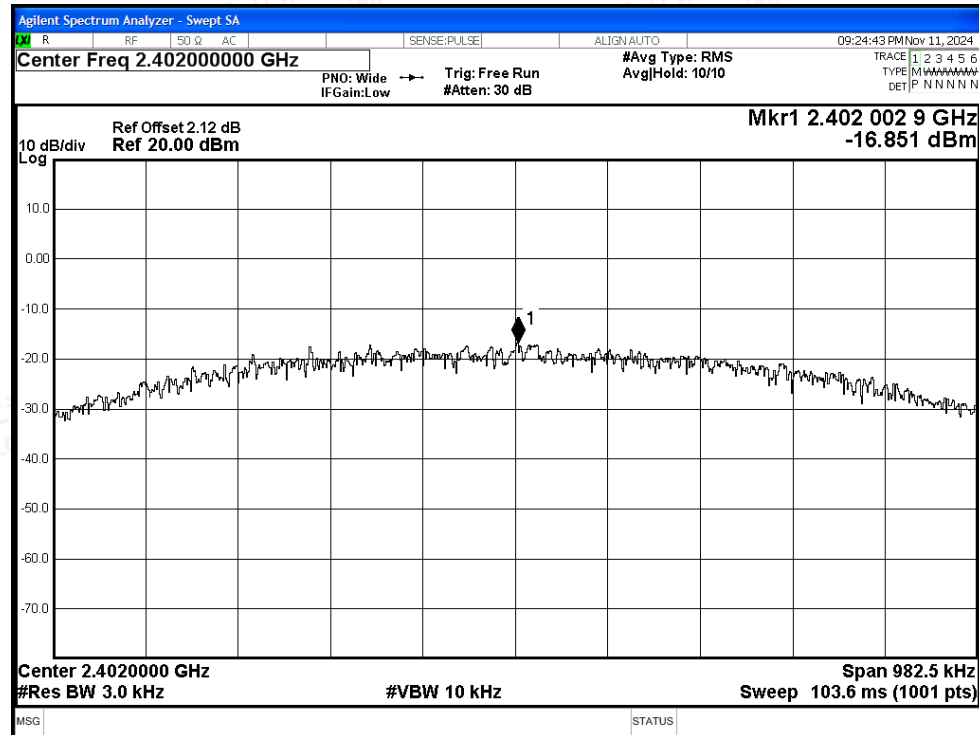
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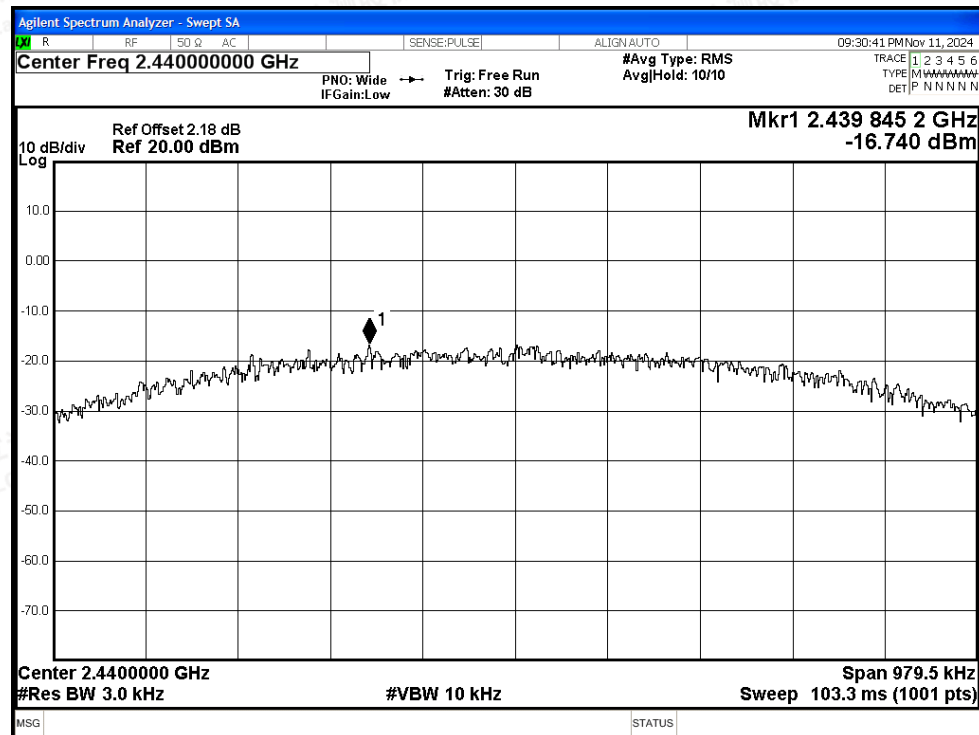


Test Graphs

PSD NVNT BLE 1M 2402MHz Ant



PSD NVNT BLE 1M 2440MHz Ant

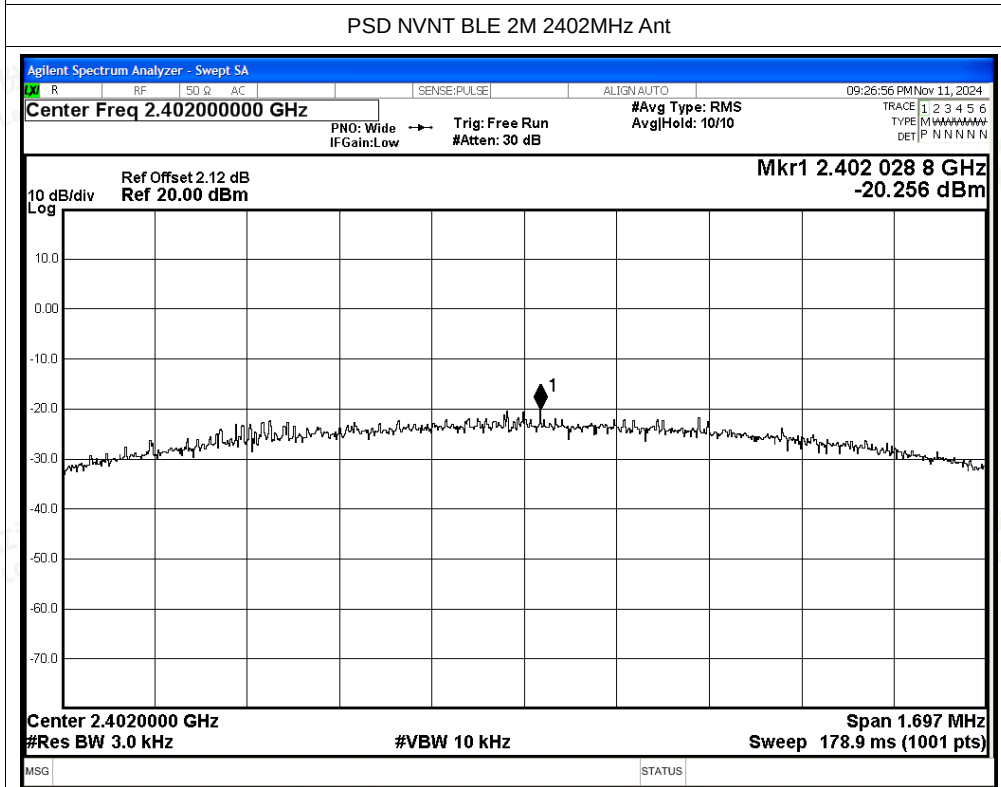
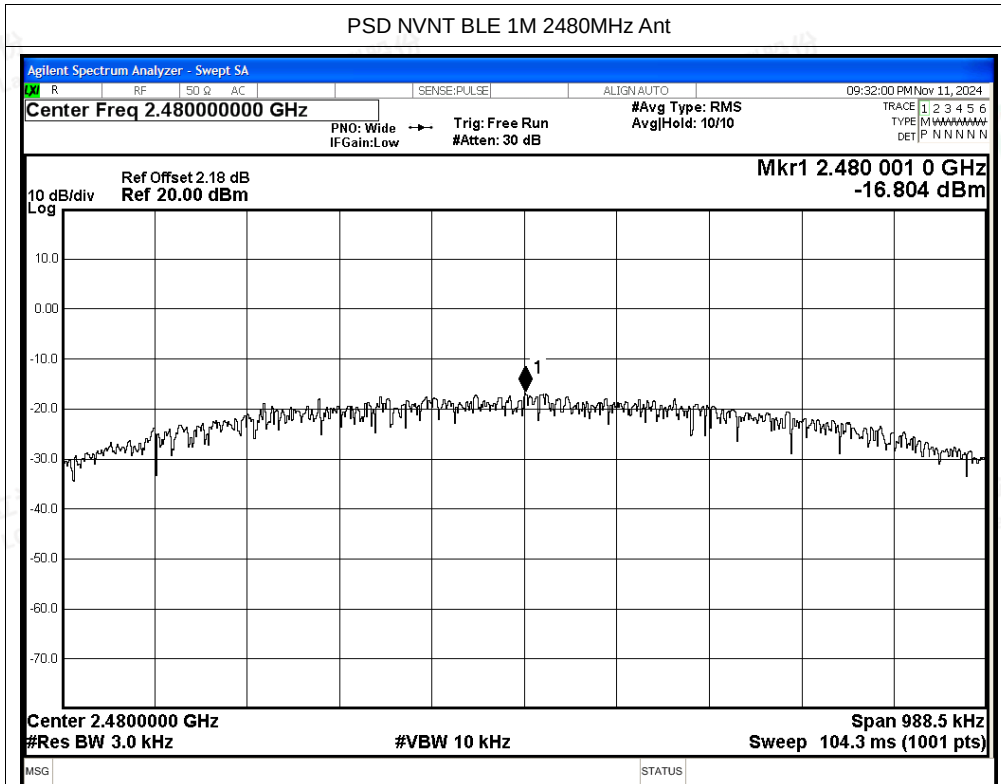


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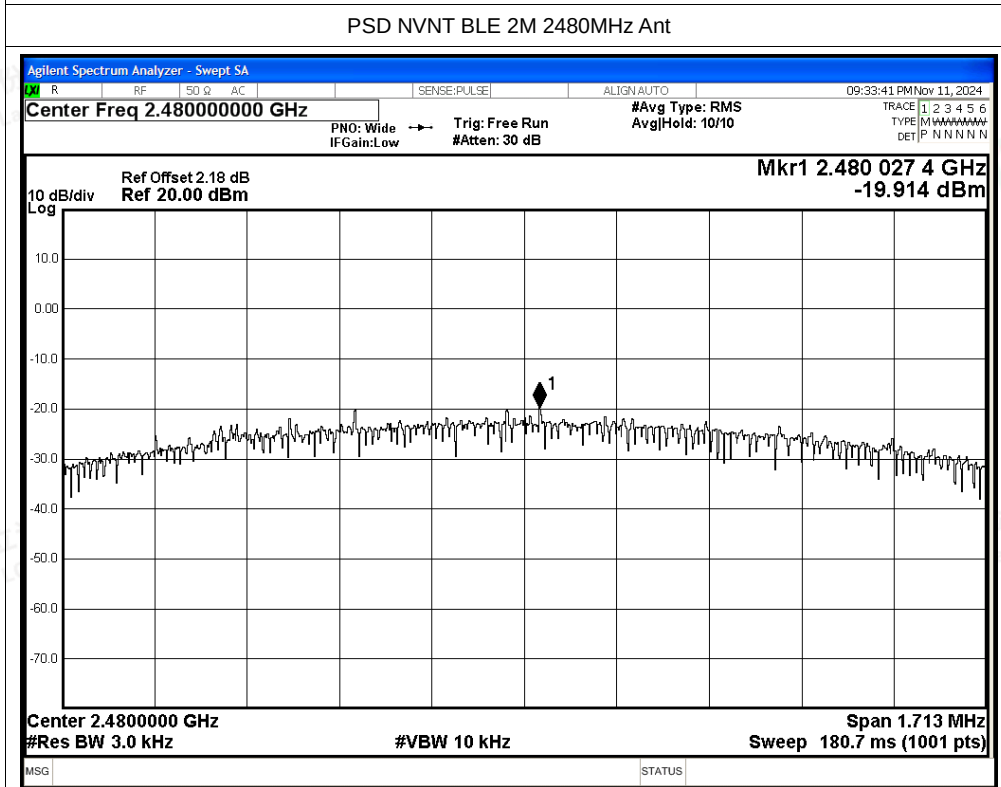
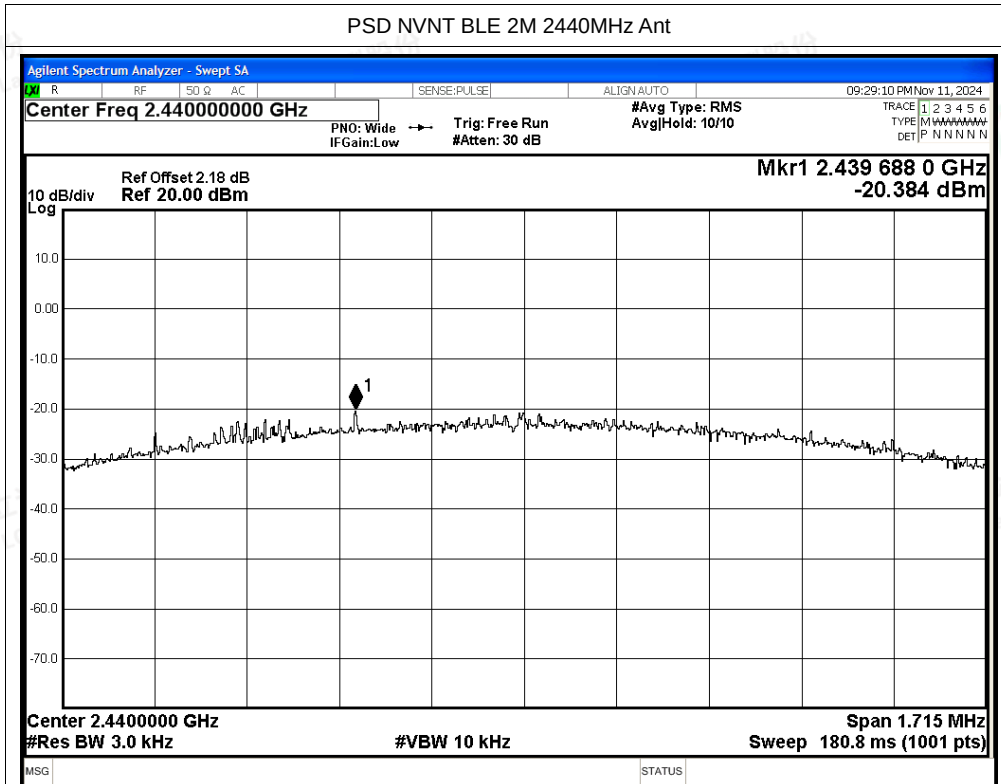


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B.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant	-55.43	-20	Pass
NVNT	BLE 1M	2480	Ant	-56.04	-20	Pass
NVNT	BLE 2M	2402	Ant	-47.42	-20	Pass
NVNT	BLE 2M	2480	Ant	-56.21	-20	Pass



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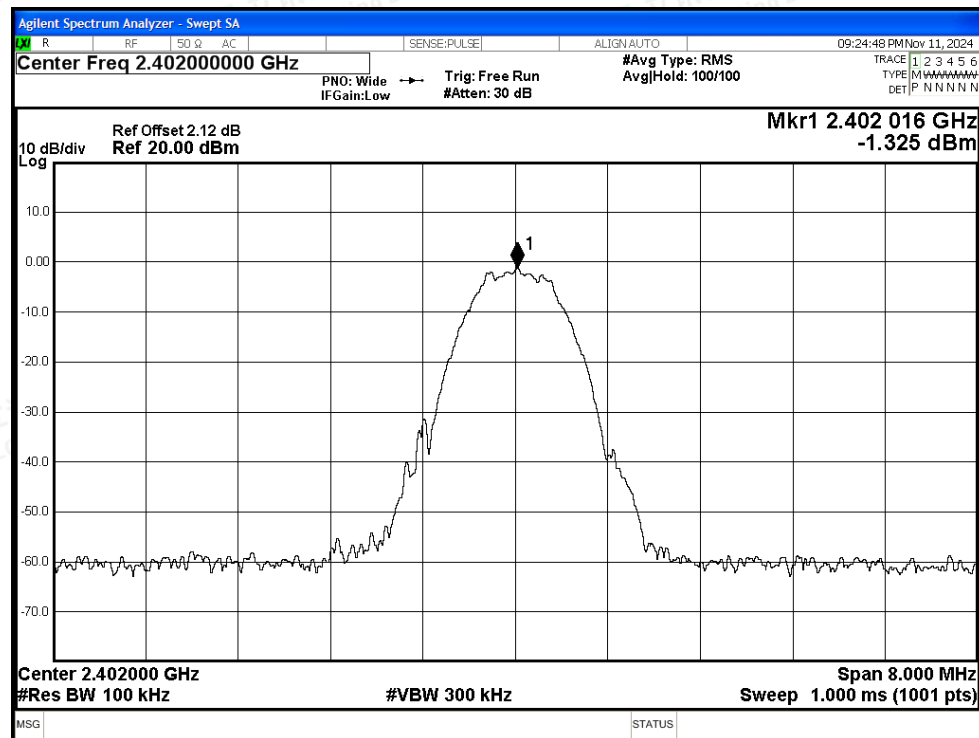
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

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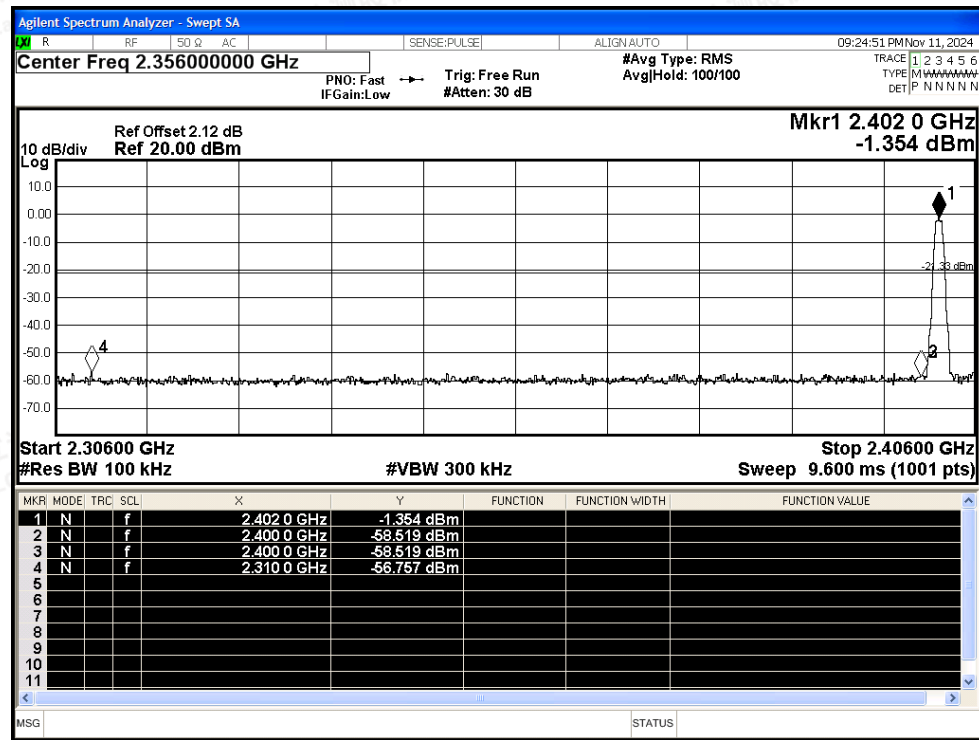


Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant Ref



Band Edge NVNT BLE 1M 2402MHz Ant Emission



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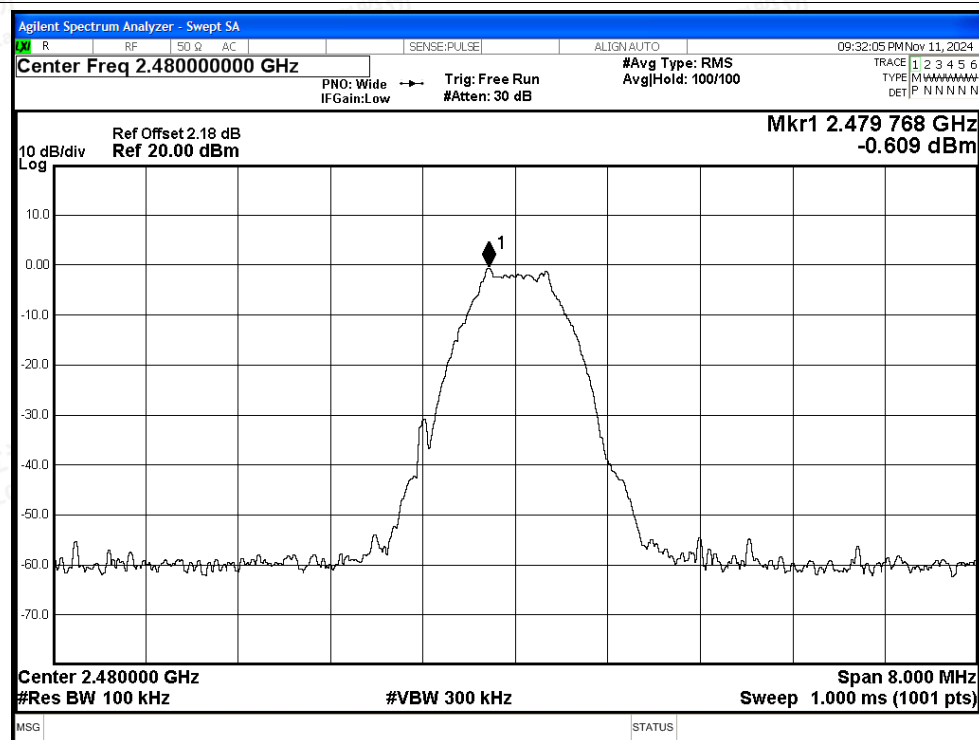
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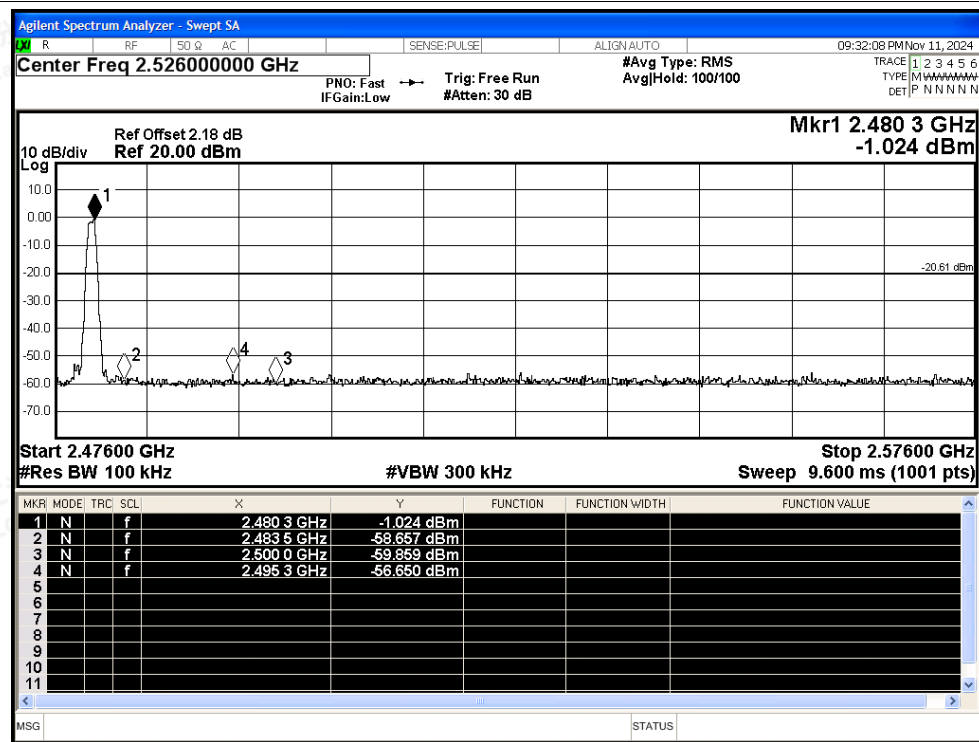
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Band Edge NVNT BLE 1M 2480MHz Ant Ref



Band Edge NVNT BLE 1M 2480MHz Ant Emission



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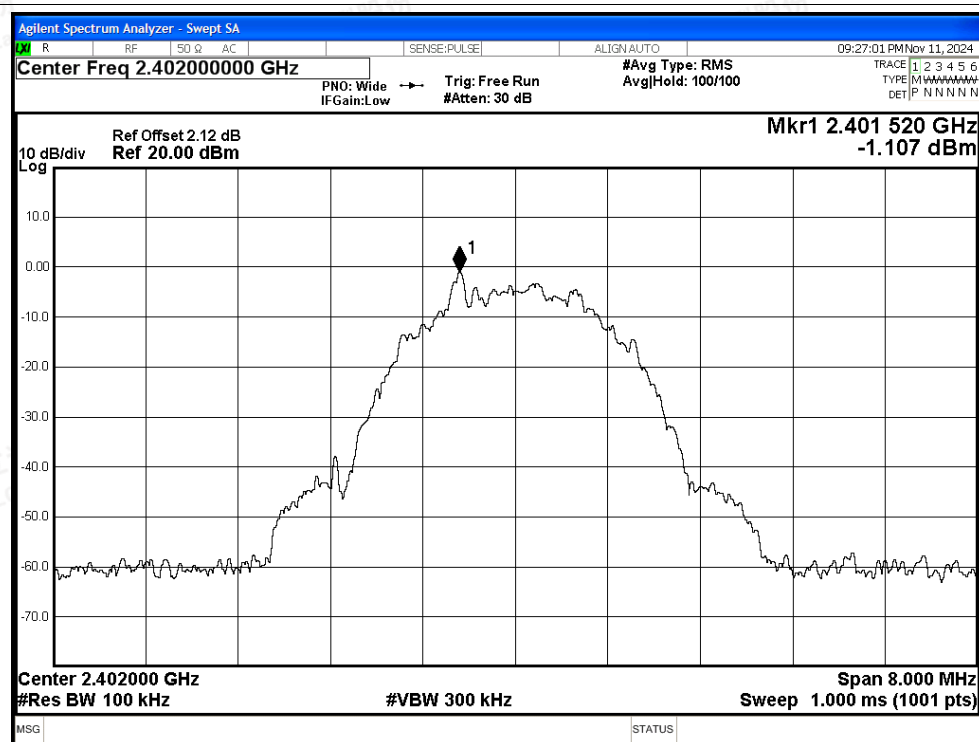
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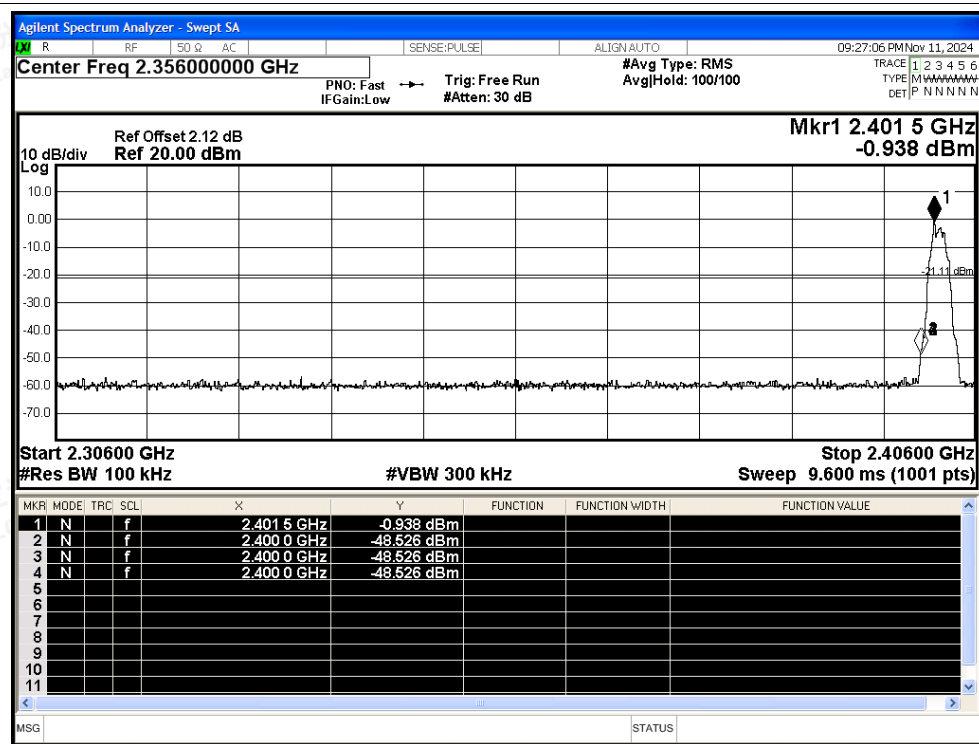
Scan code to check authenticity



Band Edge NVNT BLE 2M 2402MHz Ant Ref



Band Edge NVNT BLE 2M 2402MHz Ant Emission



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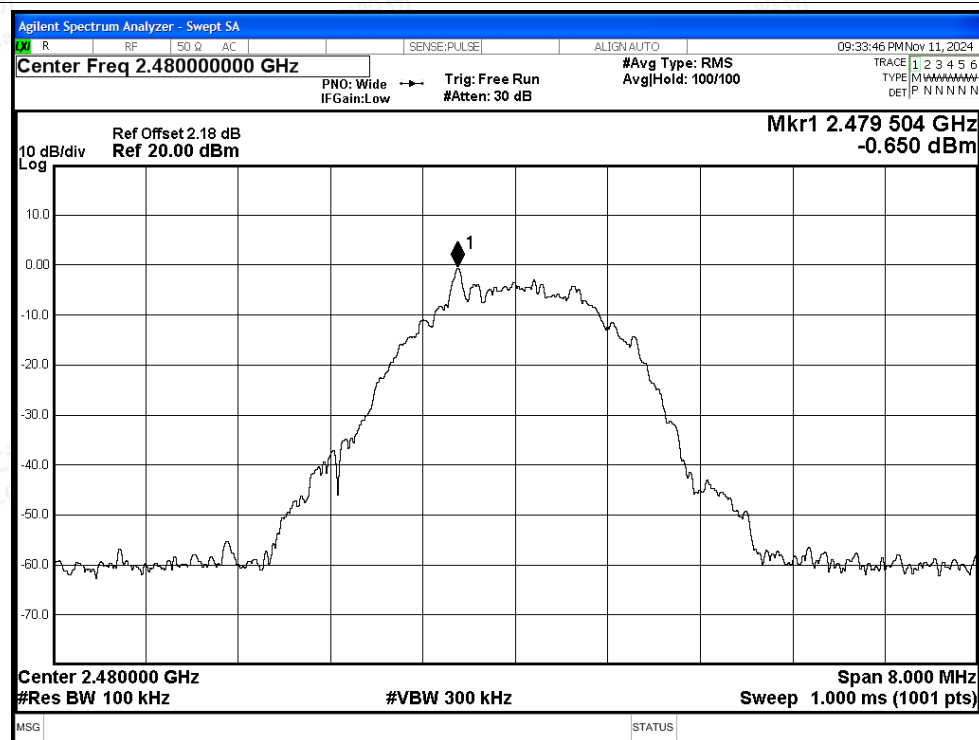
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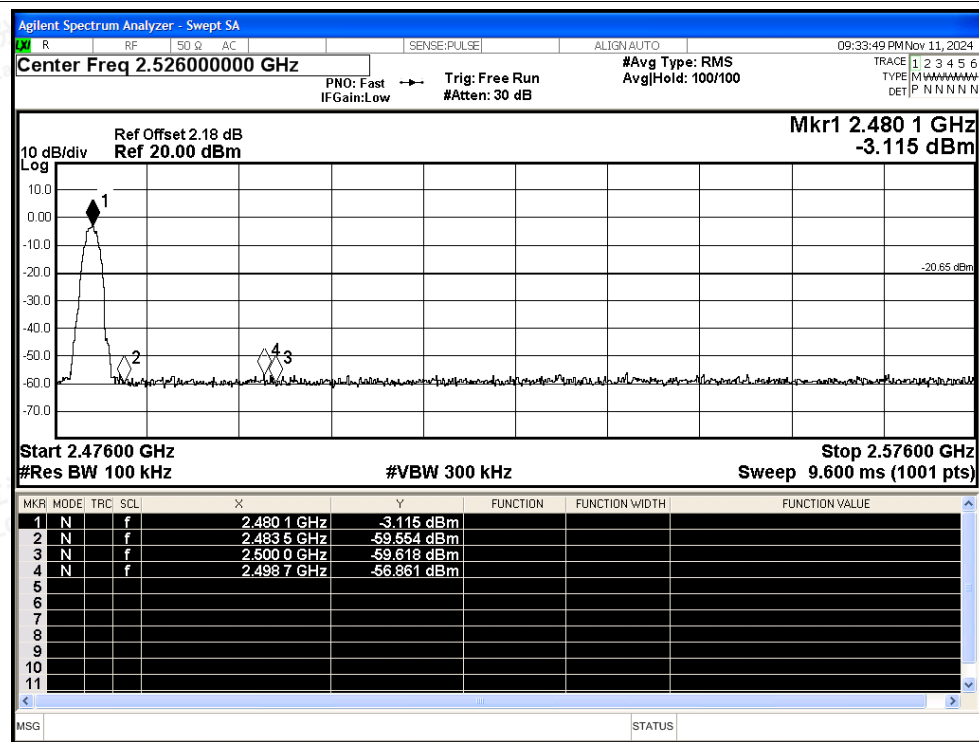
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Band Edge NVNT BLE 2M 2480MHz Ant Ref



Band Edge NVNT BLE 2M 2480MHz Ant Emission



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B.5 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant	-44.28	-20	Pass
NVNT	BLE 1M	2440	Ant	-54.5	-20	Pass
NVNT	BLE 1M	2480	Ant	-54.79	-20	Pass
NVNT	BLE 2M	2402	Ant	-53.13	-20	Pass
NVNT	BLE 2M	2440	Ant	-50.14	-20	Pass
NVNT	BLE 2M	2480	Ant	-52.36	-20	Pass



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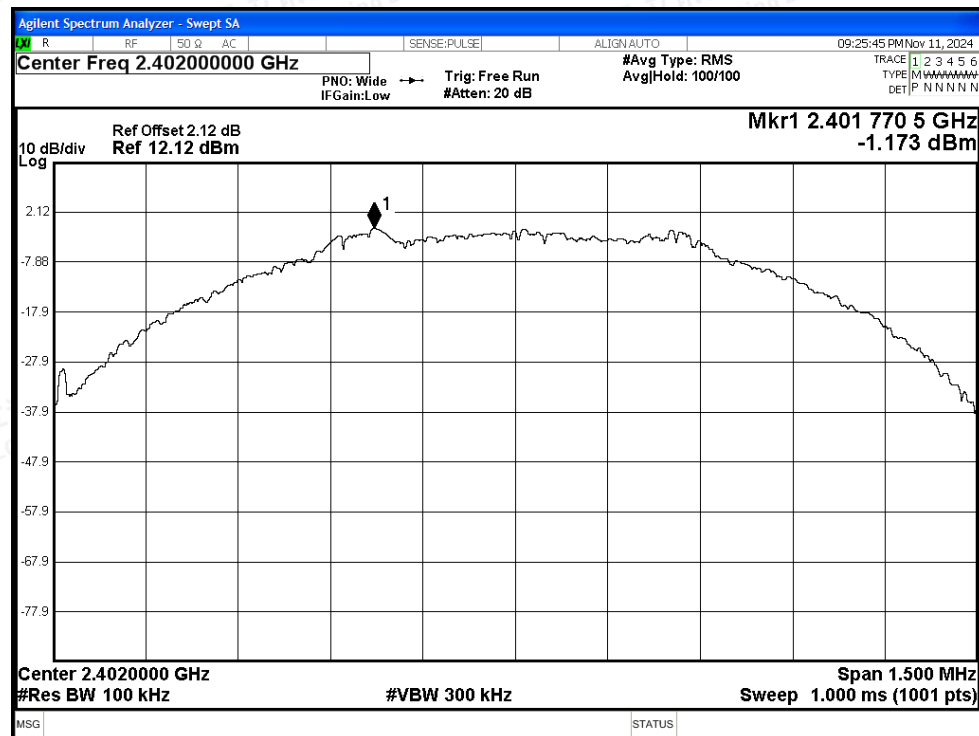
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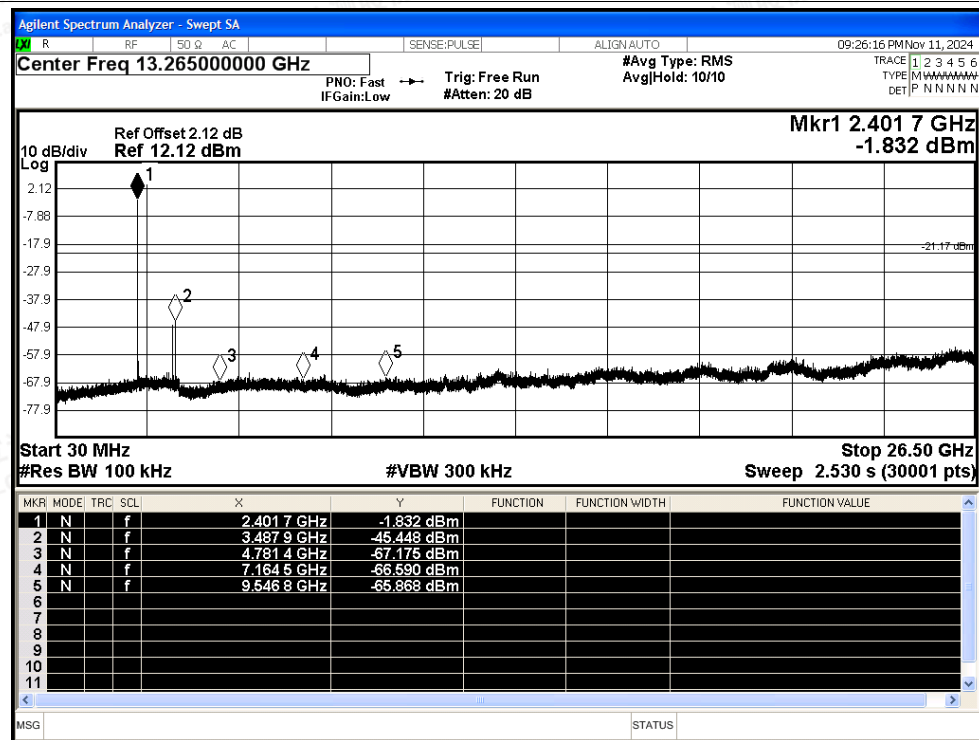


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant Ref



Tx. Spurious NVNT BLE 1M 2402MHz Ant Emission



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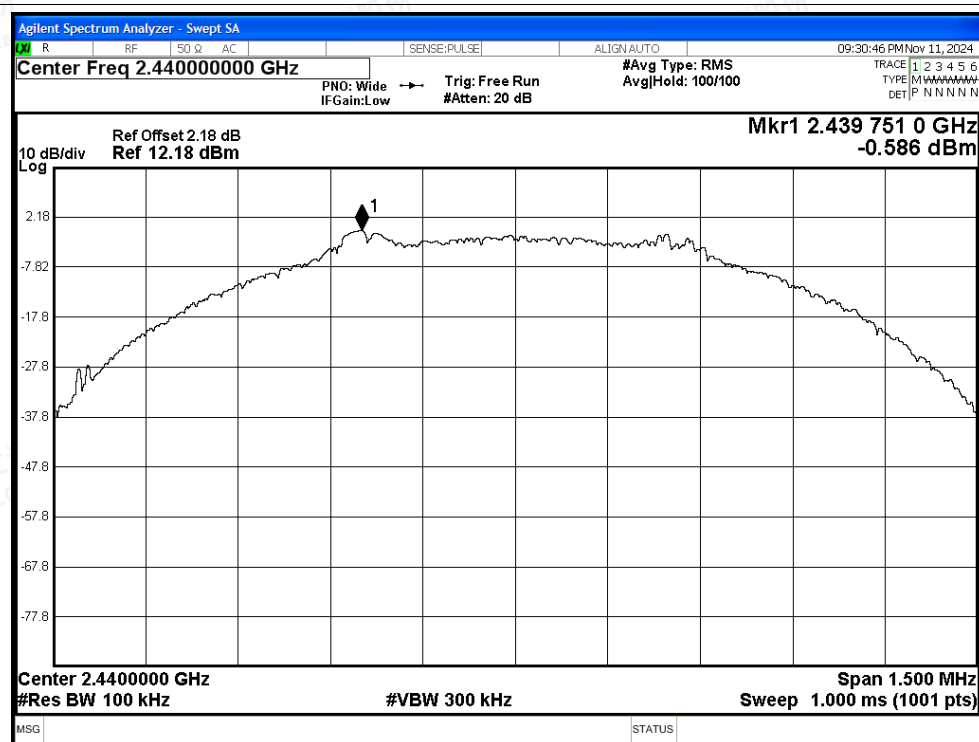
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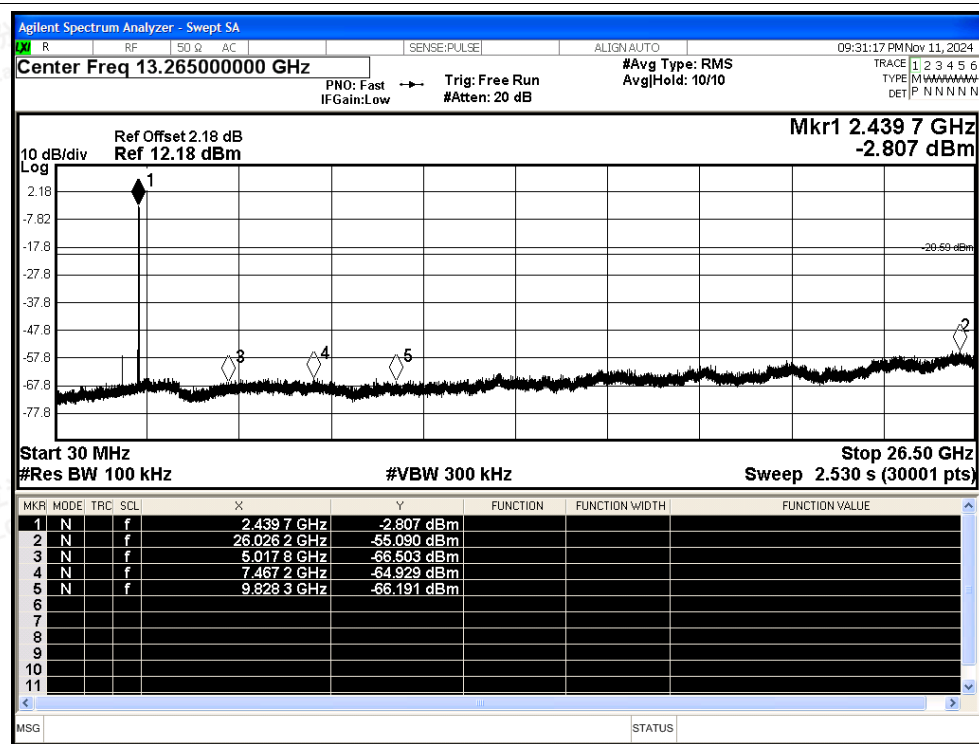
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Tx. Spurious NVNT BLE 1M 2440MHz Ant Ref



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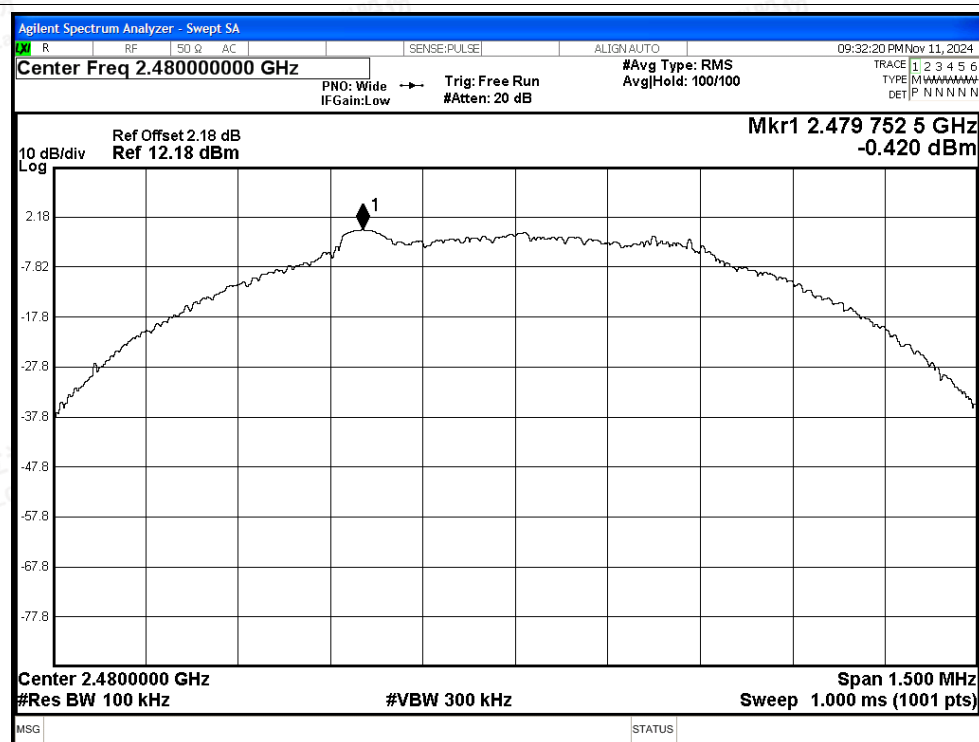
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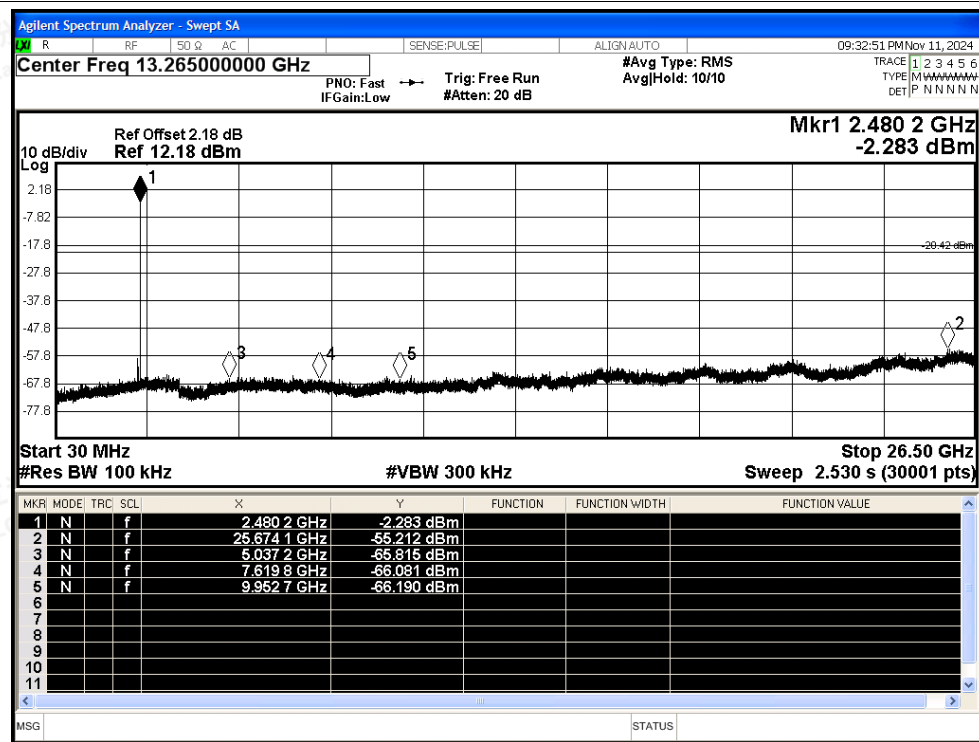
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Tx. Spurious NVNT BLE 1M 2480MHz Ant Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant Emission



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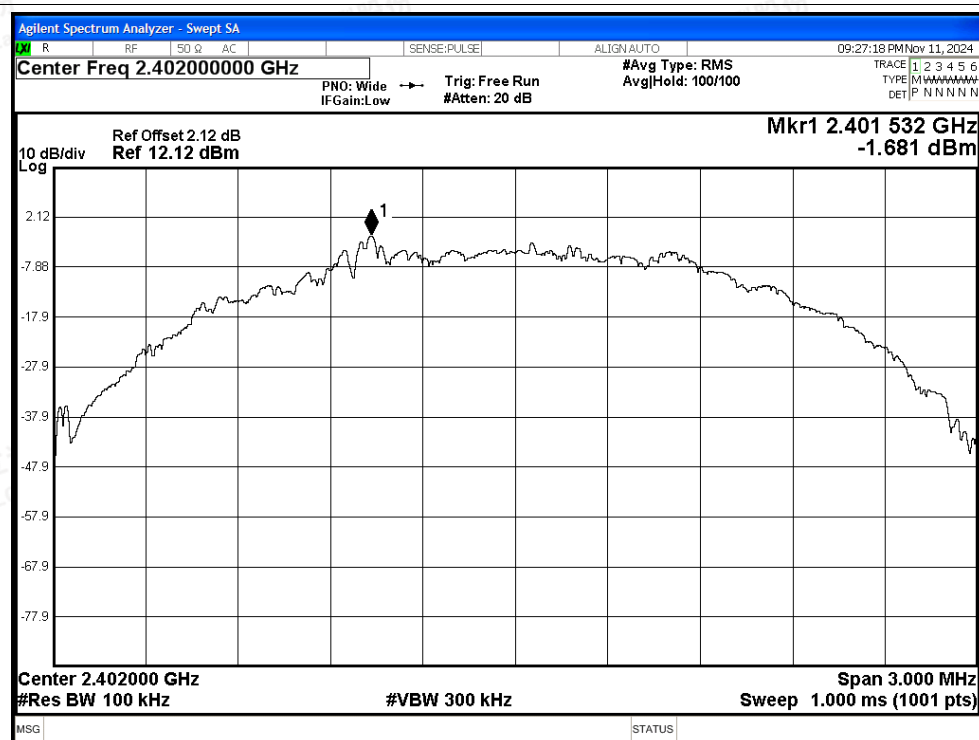
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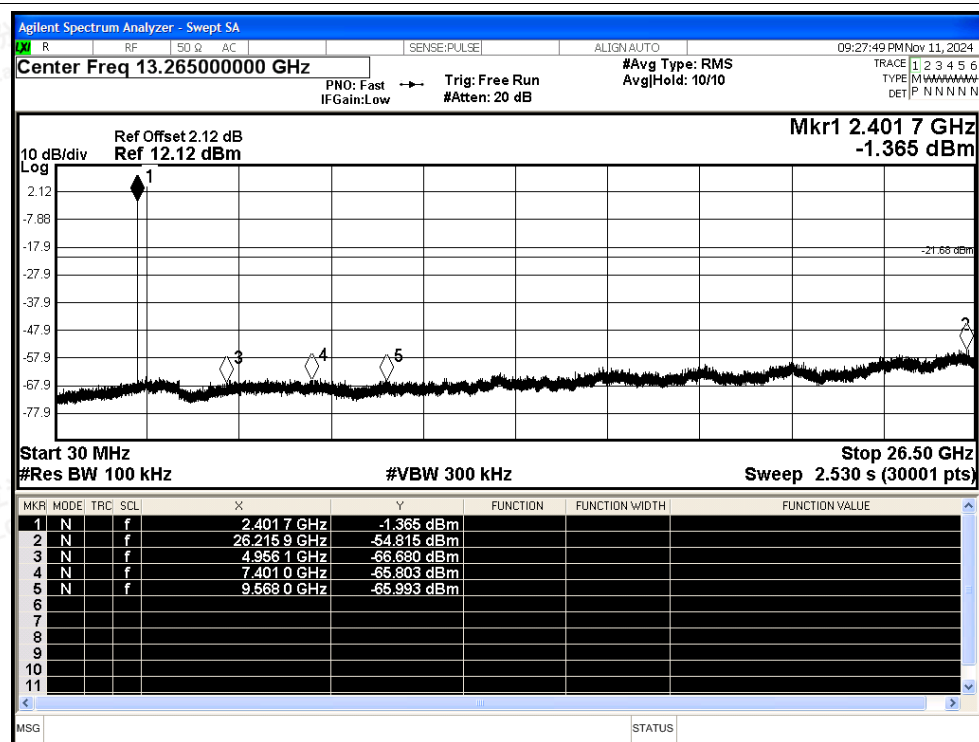
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Tx. Spurious NVNT BLE 2M 2402MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2402MHz Ant Emission



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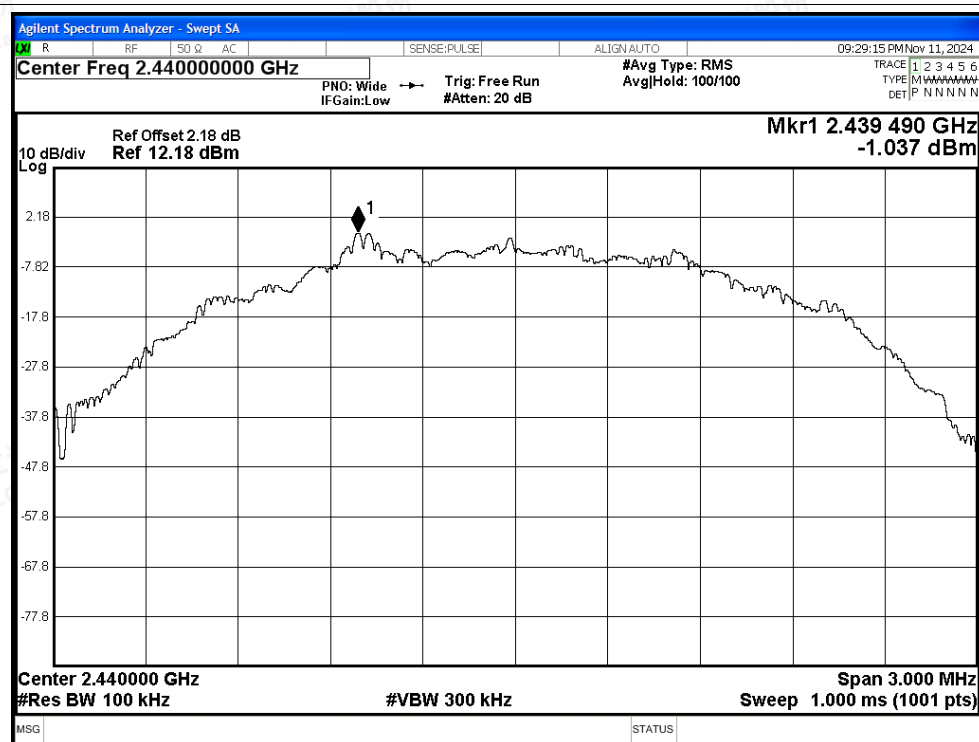
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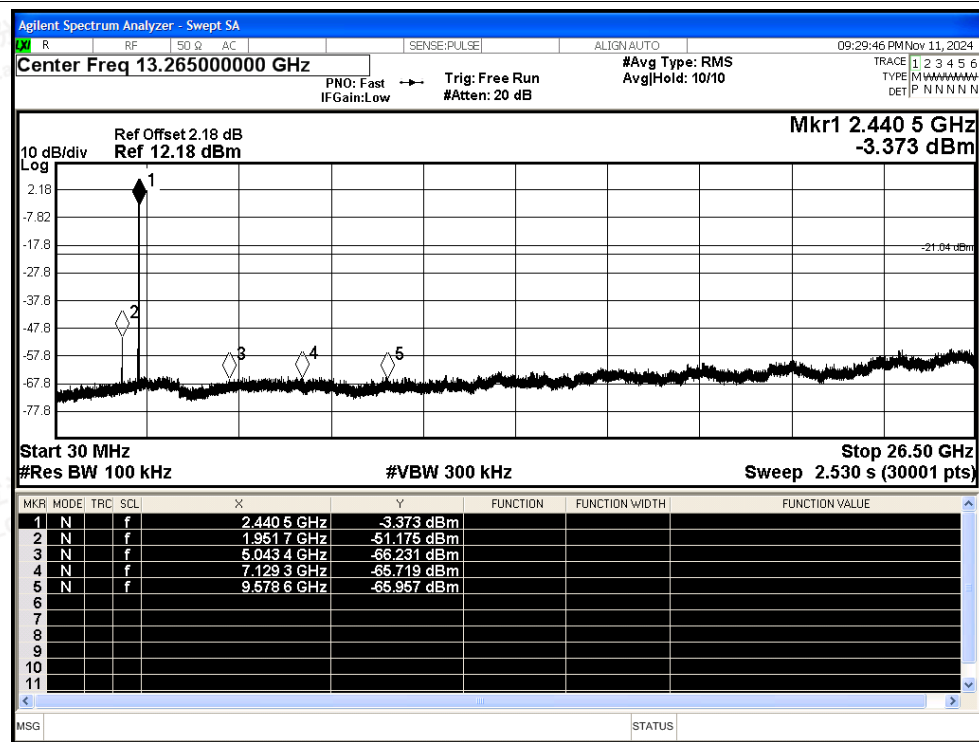
Scan code to check authenticity



Tx. Spurious NVNT BLE 2M 2440MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2440MHz Ant Emission



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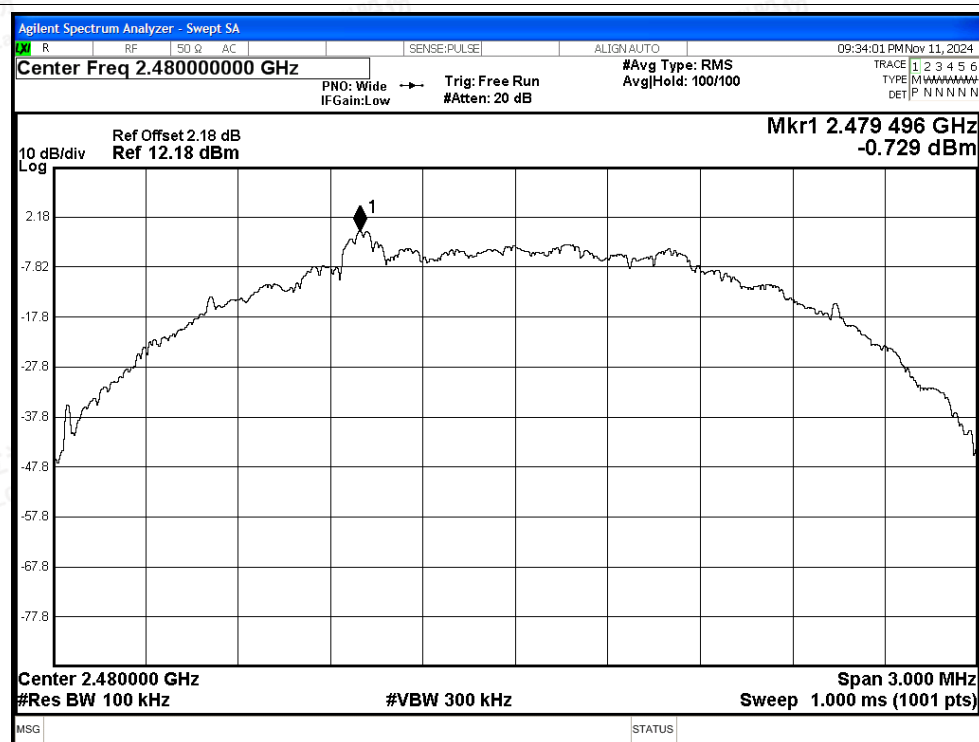
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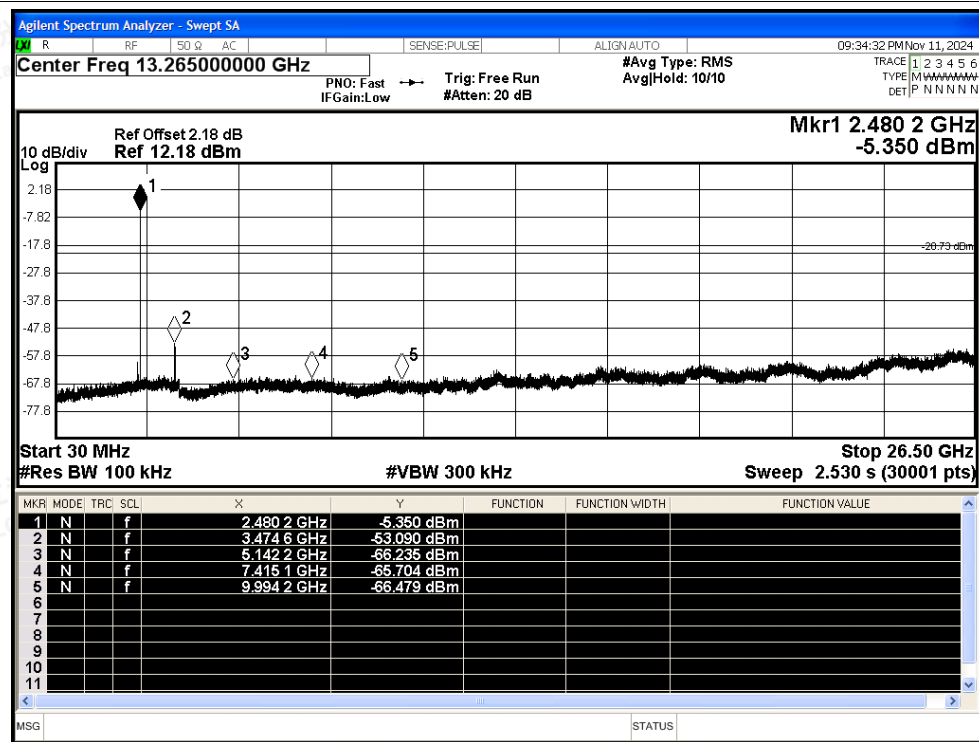
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Tx. Spurious NVNT BLE 2M 2480MHz Ant Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant Emission



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B.6 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant	87.39	0.59	0.61
NVNT	BLE 1M	2440	Ant	87.39	0.59	0.61
NVNT	BLE 1M	2480	Ant	99.51	0	0.61
NVNT	BLE 2M	2402	Ant	65.92	1.81	1.21
NVNT	BLE 2M	2440	Ant	98.1	0	1.21
NVNT	BLE 2M	2480	Ant	65.89	1.81	1.21



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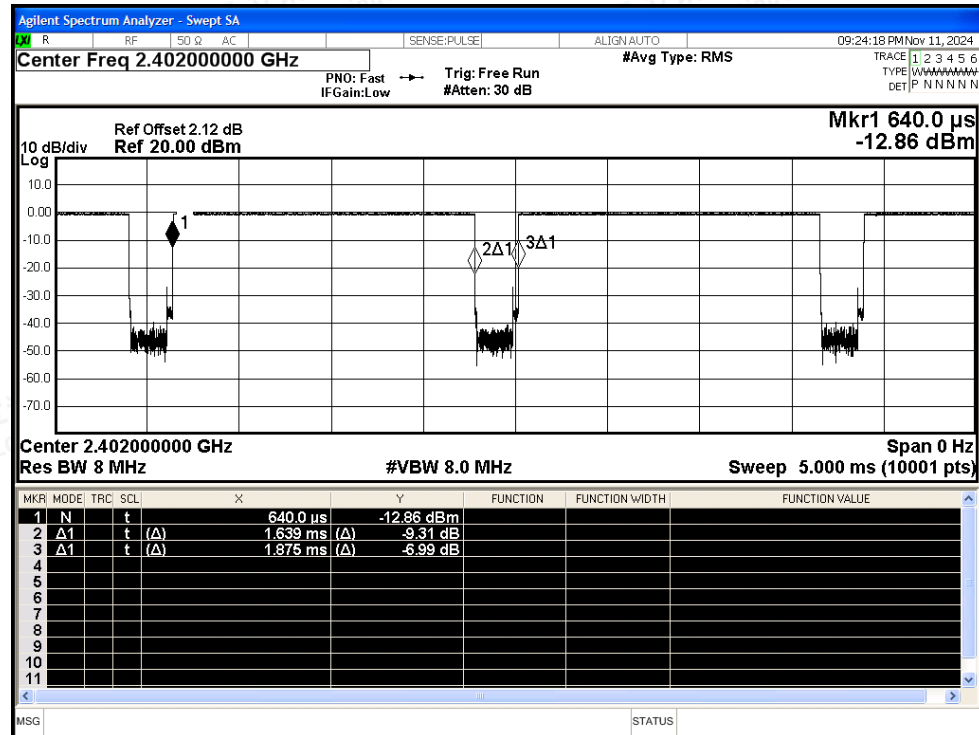
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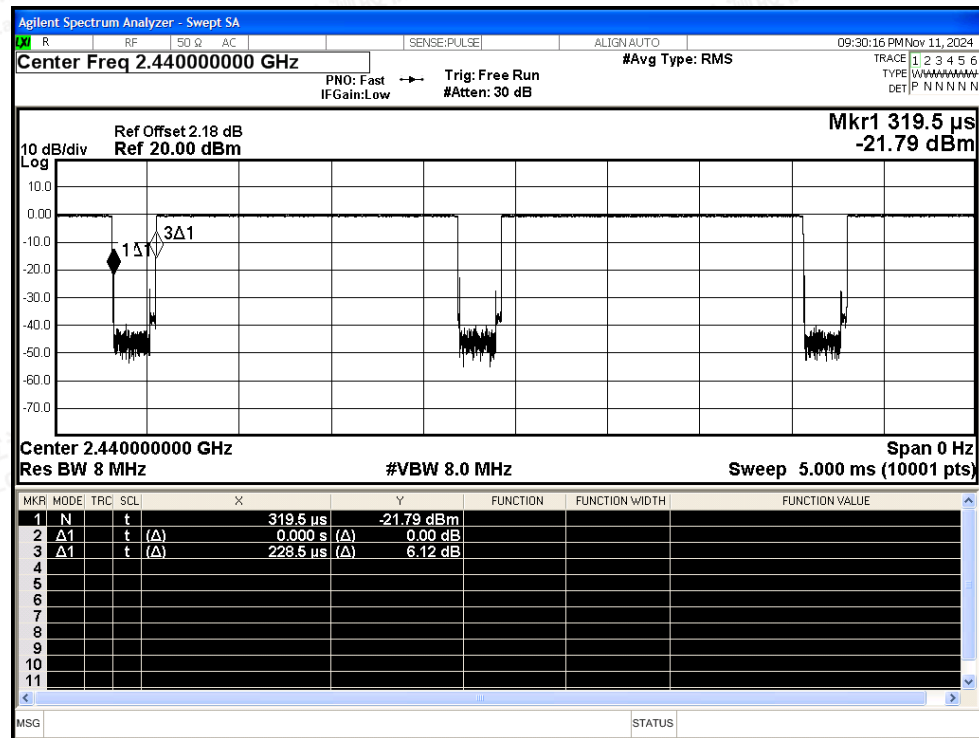


Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant



Duty Cycle NVNT BLE 1M 2440MHz Ant



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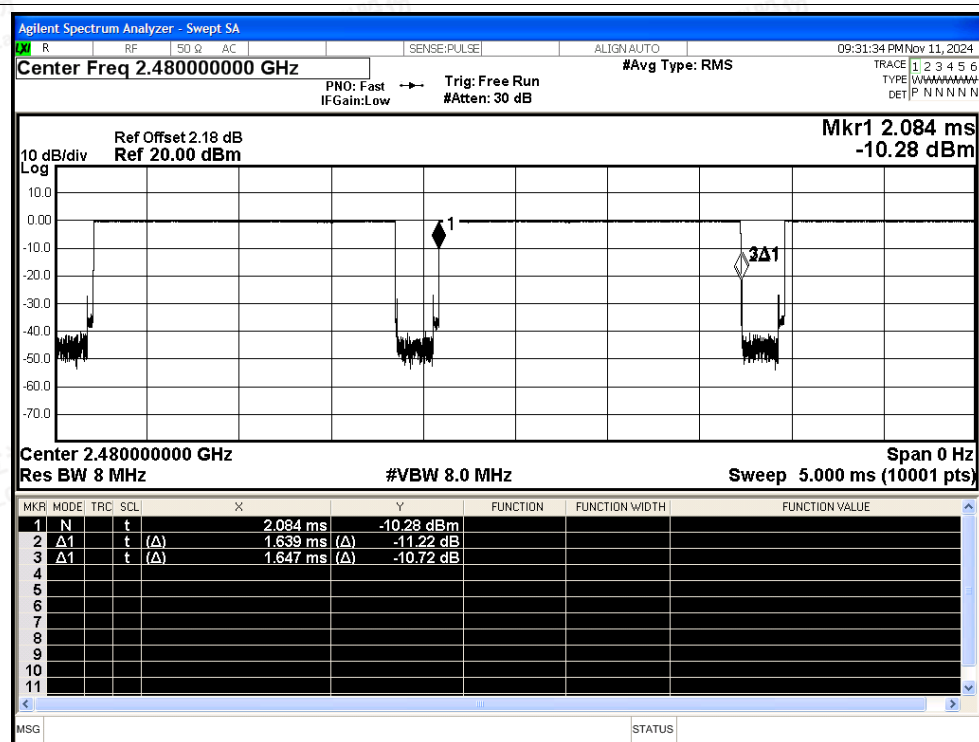
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Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

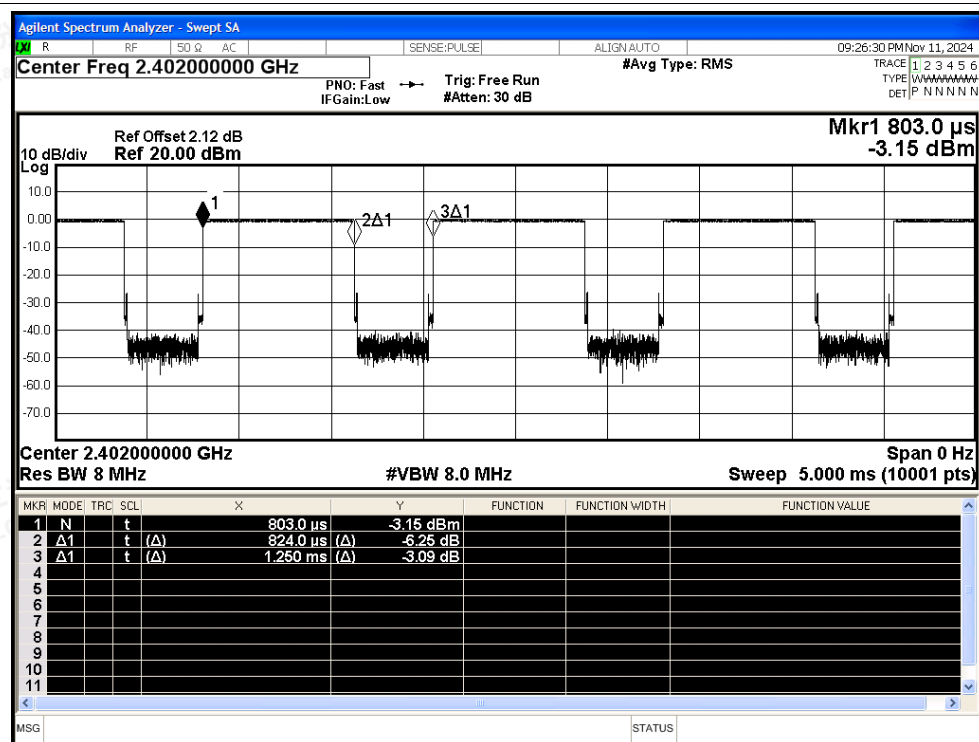
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Duty Cycle NVNT BLE 1M 2480MHz Ant



Duty Cycle NVNT BLE 2M 2402MHz Ant



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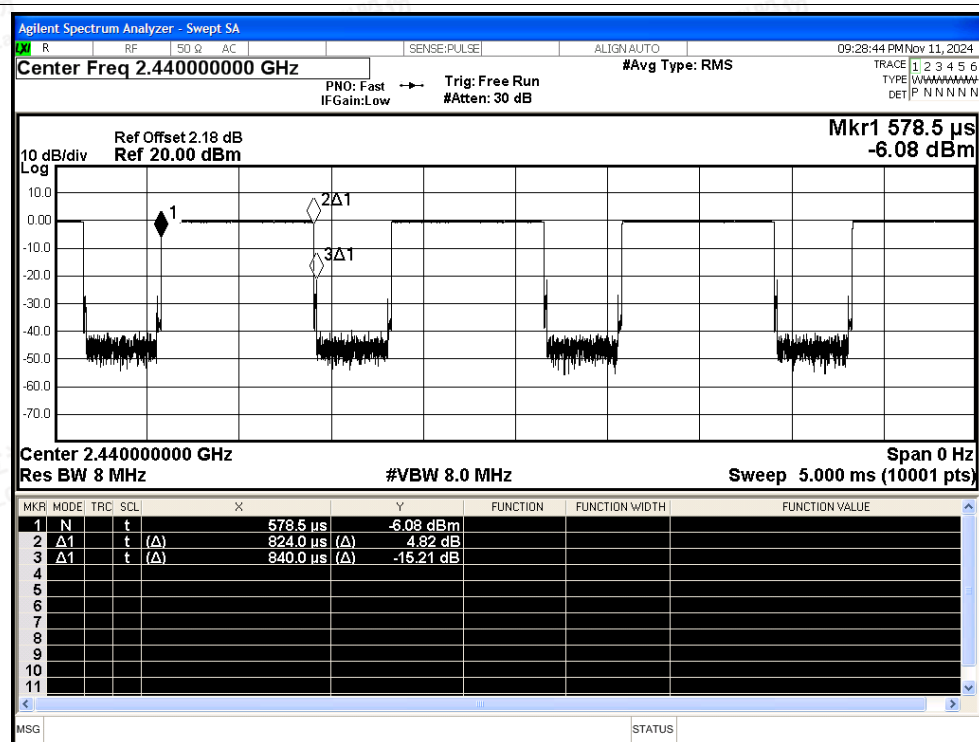
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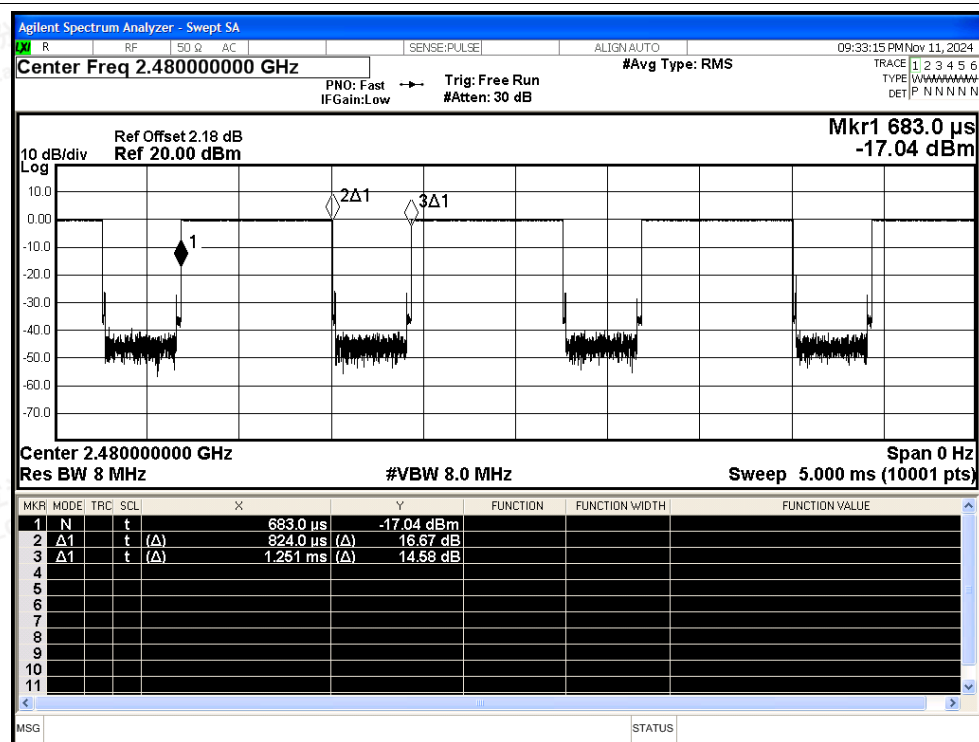
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Duty Cycle NVNT BLE 2M 2440MHz Ant



Duty Cycle NVNT BLE 2M 2480MHz Ant



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B.7 Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant	2310	-51.98	3.95	-	47.23	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2310	-59.1	3.95	0.59	40.70	Average	54	Pass
NVNT	BLE 1M	2402	Ant	2375.568	-47.4	3.95	-	51.81	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2369.136	-57.57	3.95	0.59	42.23	Average	54	Pass
NVNT	BLE 1M	2402	Ant	2390	-51.09	3.95	-	48.12	Peak	74	Pass
NVNT	BLE 1M	2402	Ant	2390	-58.04	3.95	0.59	41.76	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2483.5	-50.4	3.95	-	48.81	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2483.5	-57.79	3.95	0	41.42	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2483.68	-38.44	3.95	-	60.77	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2484.568	-56.7	3.95	0	42.51	Average	54	Pass
NVNT	BLE 1M	2480	Ant	2500	-49.84	3.95	-	49.37	Peak	74	Pass
NVNT	BLE 1M	2480	Ant	2500	-57.81	3.95	0	41.40	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2310	-51.05	3.95	-	48.16	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2310	-58.35	3.95	1.81	42.67	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2386.704	-46.92	3.95	-	52.29	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2386.992	-57.29	3.95	1.81	43.73	Average	54	Pass
NVNT	BLE 2M	2402	Ant	2390	-51.39	3.95	-	47.82	Peak	74	Pass
NVNT	BLE 2M	2402	Ant	2390	-58.08	3.95	1.81	42.94	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2483.5	-47.23	3.95	-	51.98	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2483.5	-57.46	3.95	1.81	43.56	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2483.536	-47.13	3.95	-	52.08	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2484.016	-57.13	3.95	1.81	43.89	Average	54	Pass
NVNT	BLE 2M	2480	Ant	2500	-50.11	3.95	-	49.10	Peak	74	Pass
NVNT	BLE 2M	2480	Ant	2500	-57.76	3.95	1.81	43.26	Average	54	Pass



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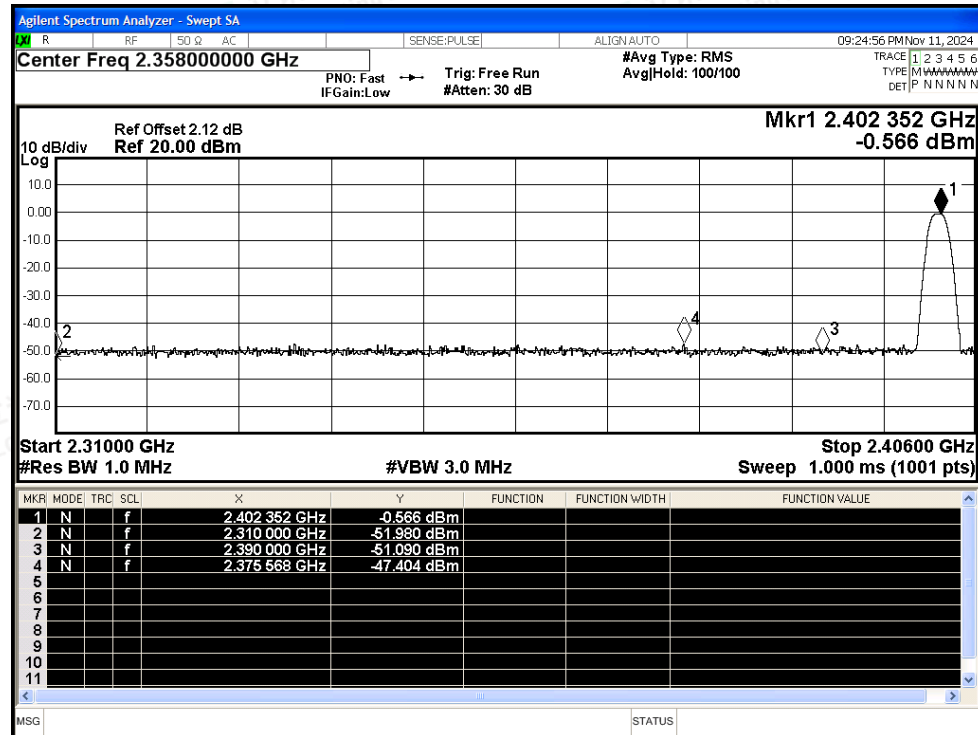
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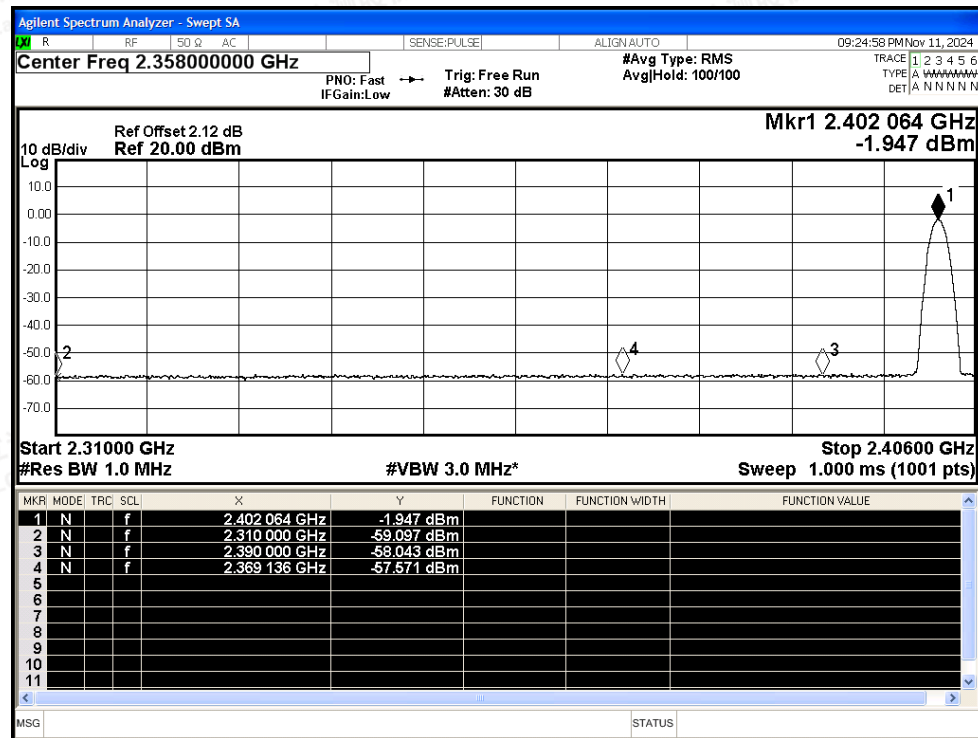


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant Peak



Restrict Band NVNT BLE 1M 2402MHz Ant Average



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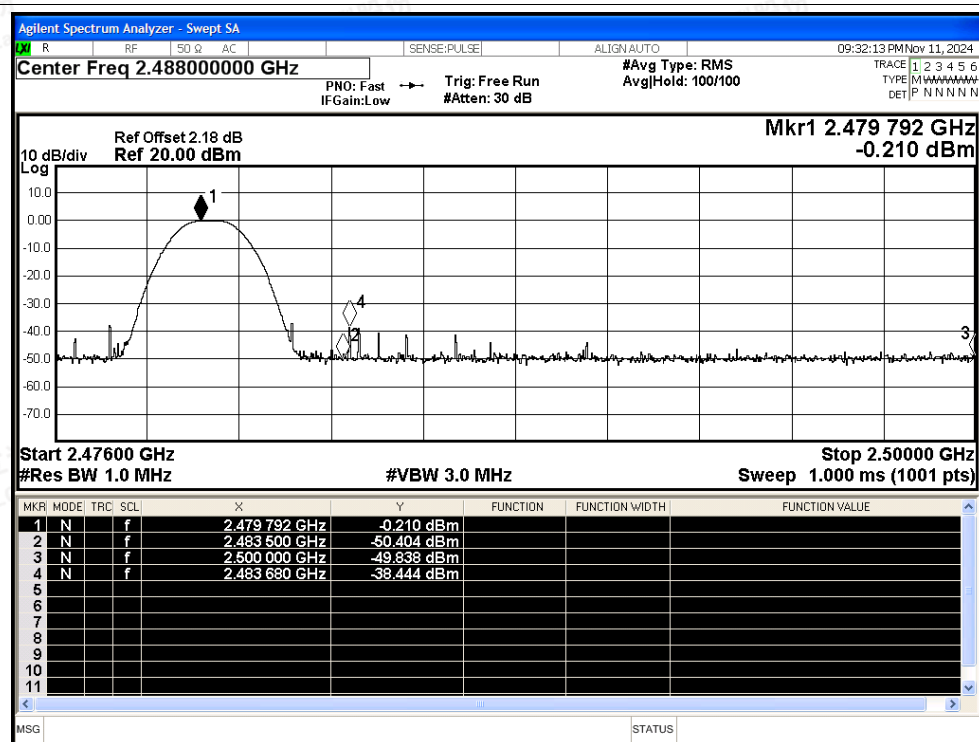
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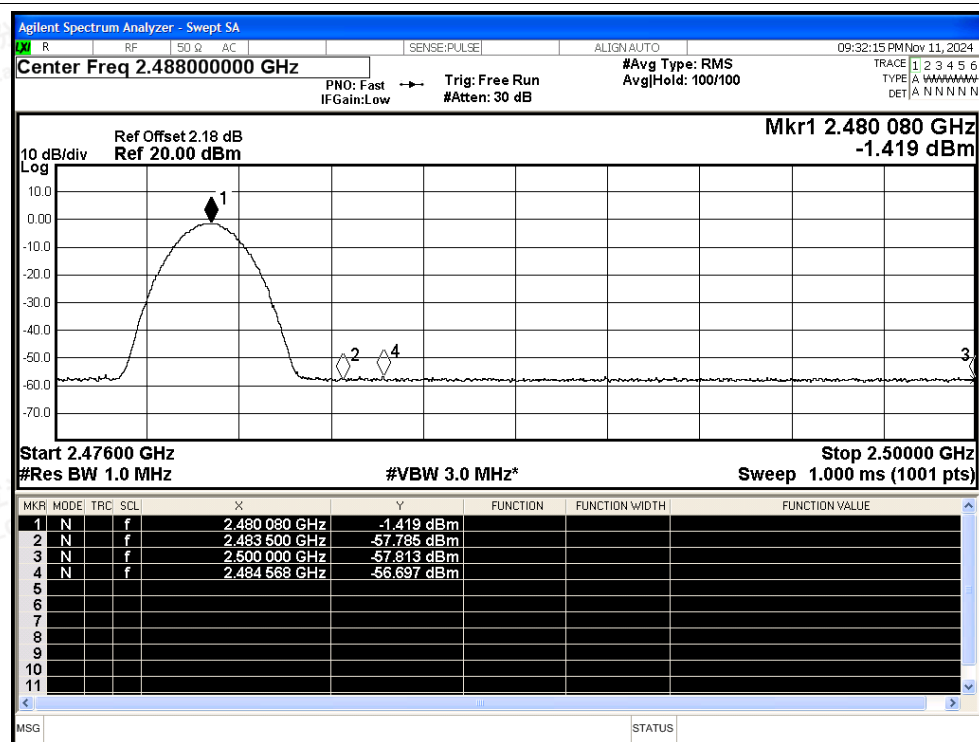
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Restrict Band NVNT BLE 1M 2480MHz Ant Peak



Restrict Band NVNT BLE 1M 2480MHz Ant Average



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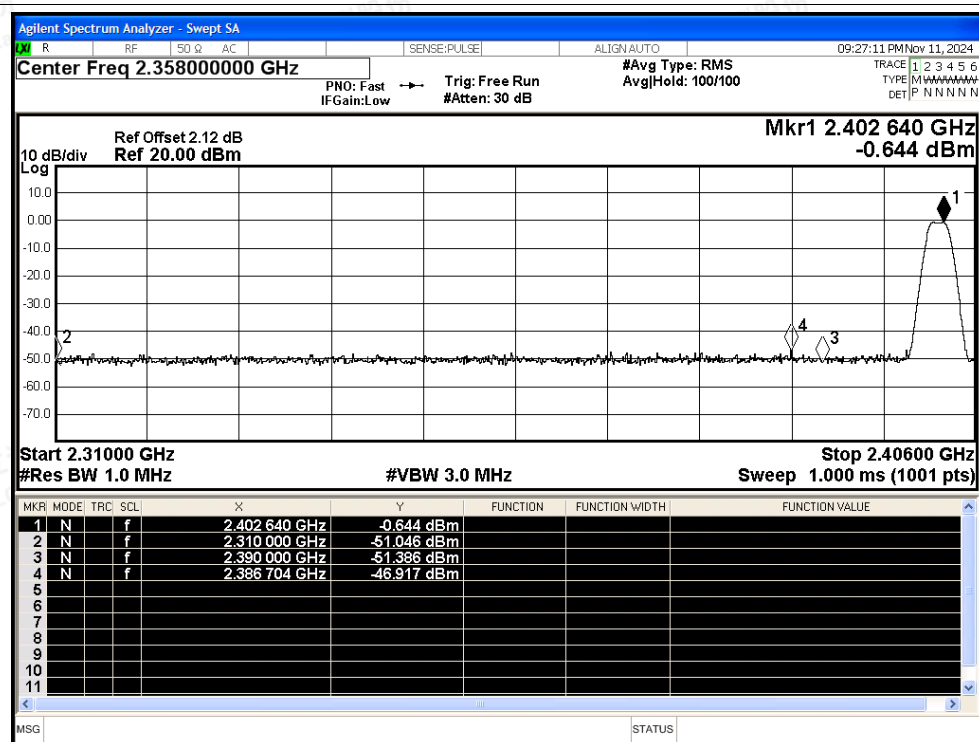
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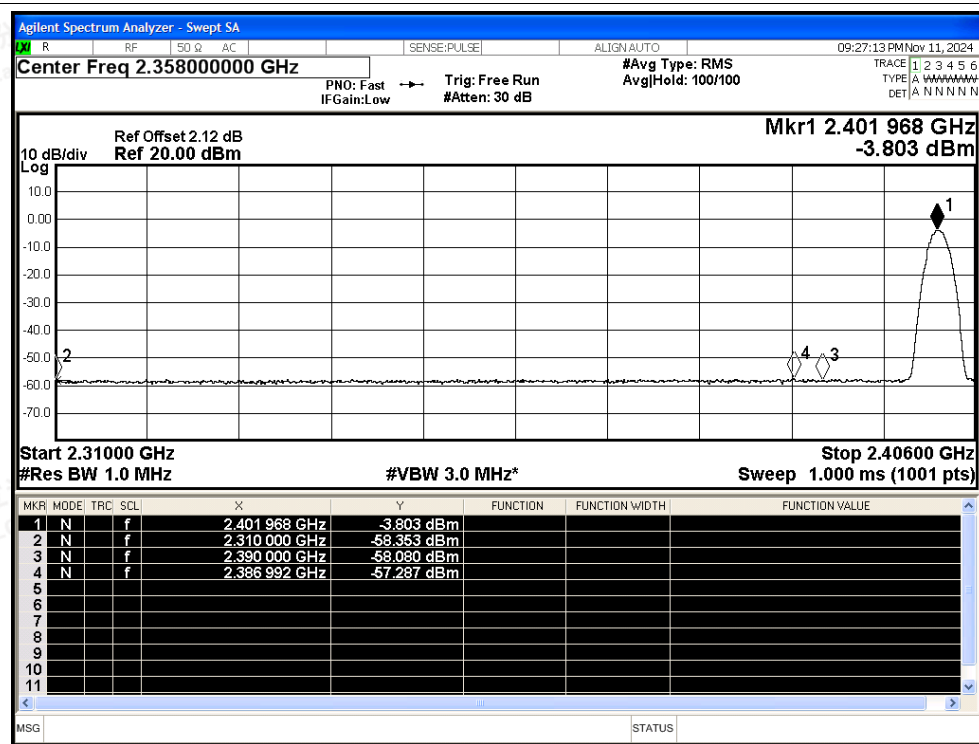
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Restrict Band NVNT BLE 2M 2402MHz Ant Peak



Restrict Band NVNT BLE 2M 2402MHz Ant Average



Shenzhen LCS Compliance Testing Laboratory Ltd.

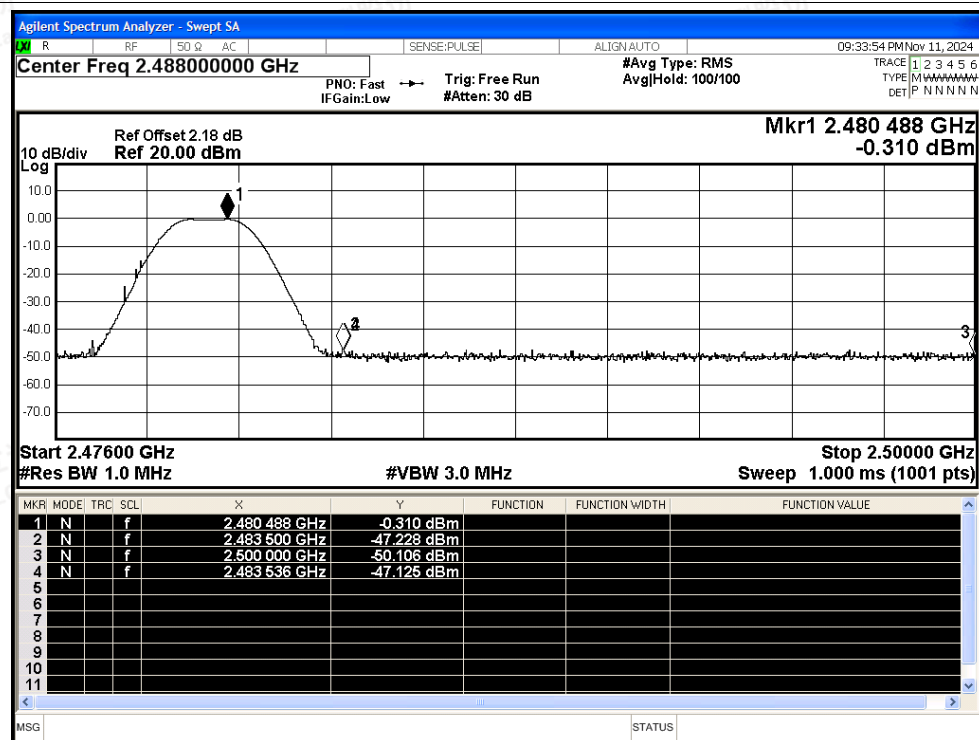
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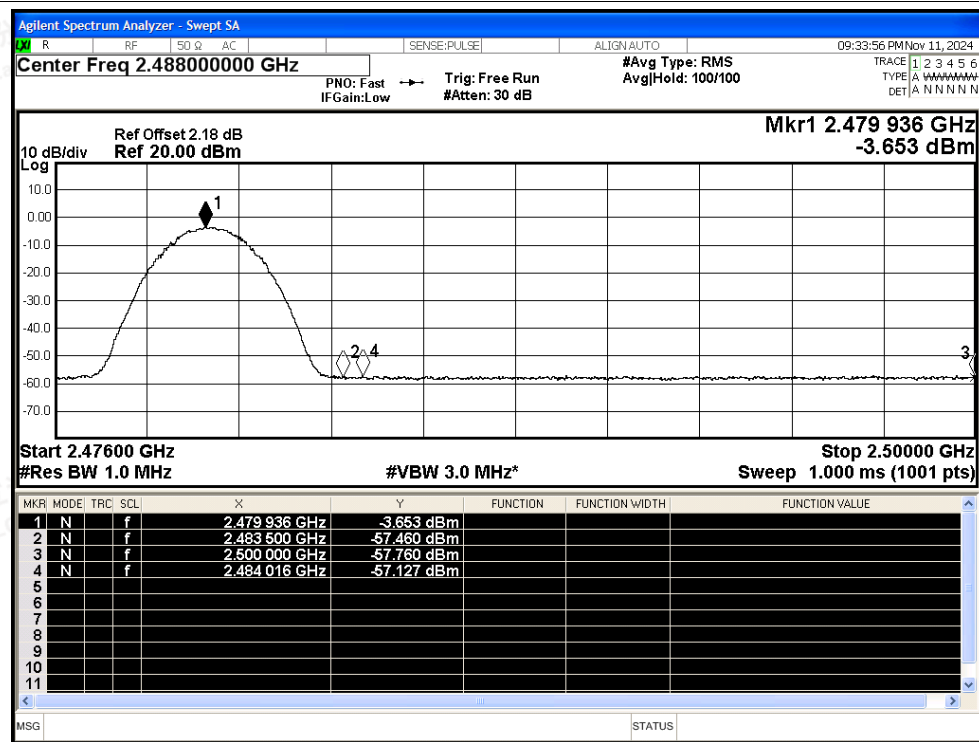
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Restrict Band NVNT BLE 2M 2480MHz Ant Peak



Restrict Band NVNT BLE 2M 2480MHz Ant Average



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